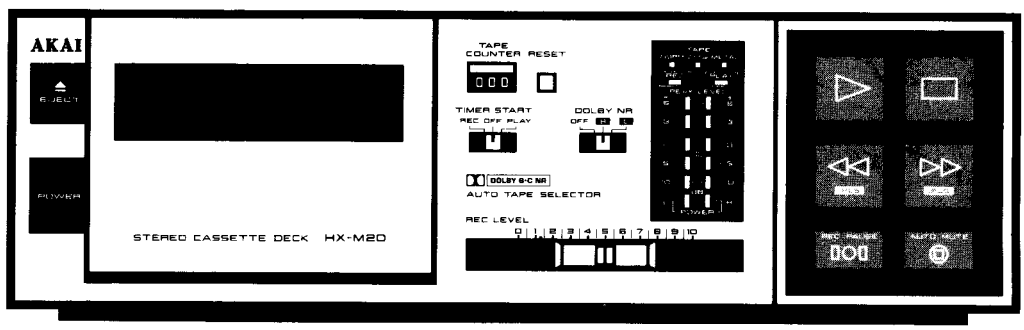
HX-M20

AKAI SERVICE MANUAL

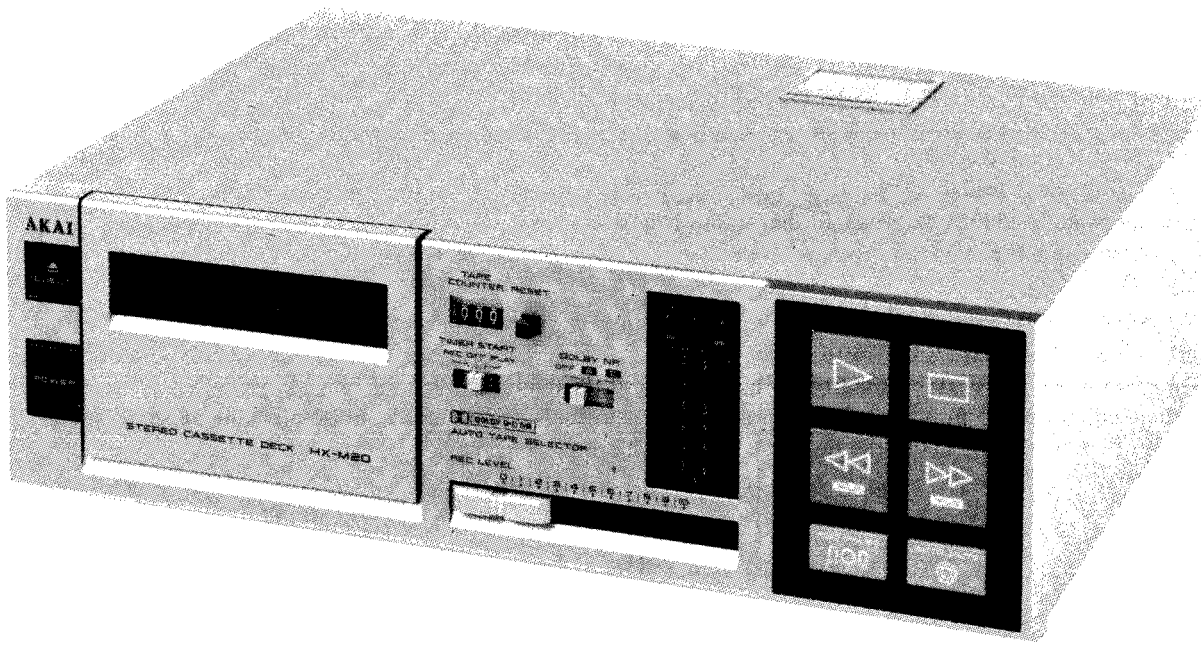


STEREO CASSETTE DECK

MODEL HX-M20

ABBREVIATIONS FOR SERVICE MANUAL
MODEL HX-M20

Abbreviation	Explanation
ADJ	ADJustment
DC	Direct Current
FF	Fast Forward
FREQ	FREQuency
H	High
IPLS	Instant Program Locating System
INV.	INVerter
L	Low
LED	Light Emitting Diode
OSC	OSCillator
P.B	Play Back
REC	RECord (RECording)
REW	REWind
SW	SWitch



STEREO CASSETTE DECK

MODEL HX-M20

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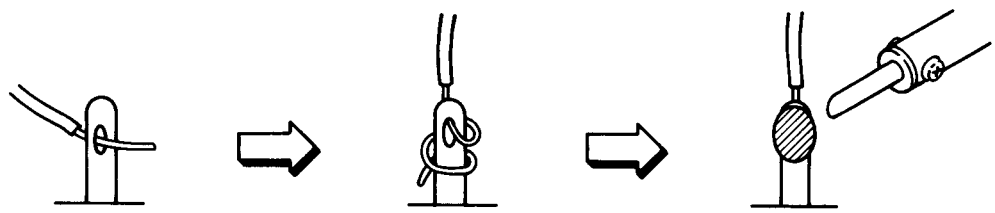
SECTION 2 PARTS LIST 11

SAFETY CHECK AFTER SERVICING

Confirm the specified insulation resistance between power cord plug prongs and externally exposed parts of the set is greater than 10 Mohms, but for equipment with external antenna terminals (tuner, receiver, etc.) and is intended for [C] or [A], specified insulation resistance should be more than 2.2 Mohms (ground terminals, microphone jacks, headphone jacks. line-in-out jacks etc.)

PRECAUTIONS DURING SERVICING

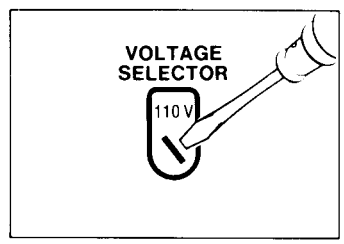
1. Parts identified by the ⚠ symbol parts are critical for safety.
   Replace only with parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation. These must also be replaced only with specified replacements.
   Examples: RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers (Insulating Barriers)
   4) Insulation sheets for transistors
   5) Plastic screws for fixing microswitch (especially in turntable)
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap ends of wires securely about the terminals before soldering.



6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locations.
9. Use care that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

VOLTAGE CONVERSION

Models for Canada, USA, Europe, UK and Australia are not equipped with this facility. Each machine is preset at the factory according to destination, but some machines can be set to 110V, 120V, 220V, or 240V as required.
If your machine's voltage can be converted:
Before connecting the power cord, turn the VOLTAGE SELECTOR located on the rear panel with a screwdriver until the correct voltage is indicated.



CYCLE CONVERSION

Cycle Conversion are not necessary since HX-M20 use a DC MOTOR.

SECTION 1

SERVICE MANUAL

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For basic adjustments, measuring methods, and operating principles, refer to GENERAL TECHNICAL MANUAL.

I. SPECIFICATIONS

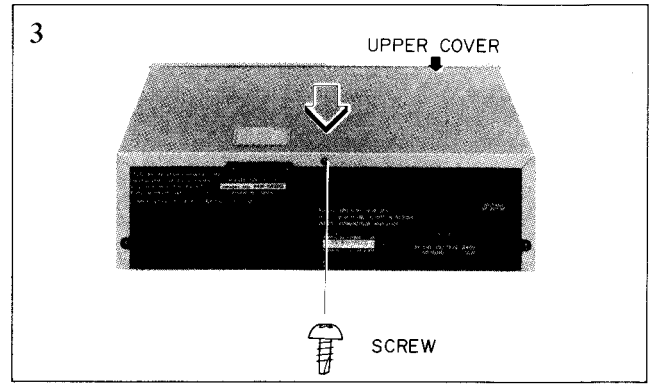
TRACK SYSTEM	4 track 2 channel Stereo System
TAPE	Philips Type Cassette
MOTOR	Electronically speed controlled DC Motor for capstan drive x 1
HEADS	High Density head for recording/playback x 1 Erase head x 1
WINDING TIME	95 sec. (C-60 tape)
WOW & FLUTTER	0.05% (WRMS), 0.09% (DIN, WTD)
DISTORTION	0.9% (Metal)
FREQUENCY RESPONSE	Metal: 20 Hz to 18,000 Hz ± 3 dB CrO_2: 20 Hz to 17,000 Hz ± 3 dB Normal: 20 Hz to 16,000 Hz ± 3 dB
S/N	56 dB (Metal Tape) Dolby C type NR ON: Improves up to 15 dB at 500 Hz, 20 dB at 1 kHz to 5 kHz Dolby B type NR ON: Improves up to 5 dB at 1 kHz, 10 dB above 5 kHz
INPUT SENSITIVITY/IMPEDANCE	LINE: 70 mV/47 kohms
OUTPUT SENSITIVITY/IMPEDANCE	LINE: 390 mV/1 kohms
POWER REQUIREMENTS	120V, 60 Hz for USA & Canada 220V, 50 Hz for Europe except UK 240V, 50 Hz for UK & Australia 110V/120V/220V/240V, 50/60 Hz switchable for other countries
DIMENSIONS	350(W) x 115 (H) x 254 (D) mm (13.8 x 4.5 x 10.0 inches)
WEIGHT	3.4 kg (7.5 lbs)

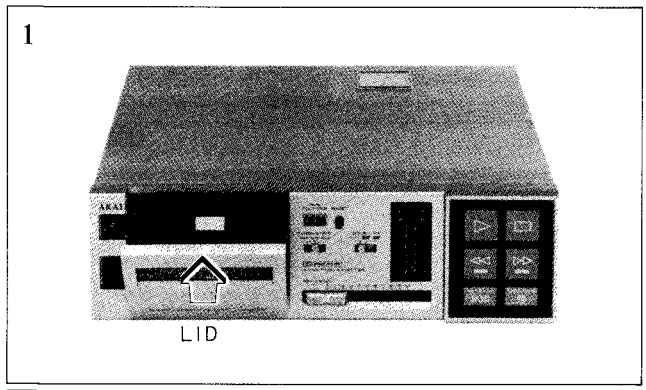
* For improvement purposes, specifications and design are subject to change without notice.

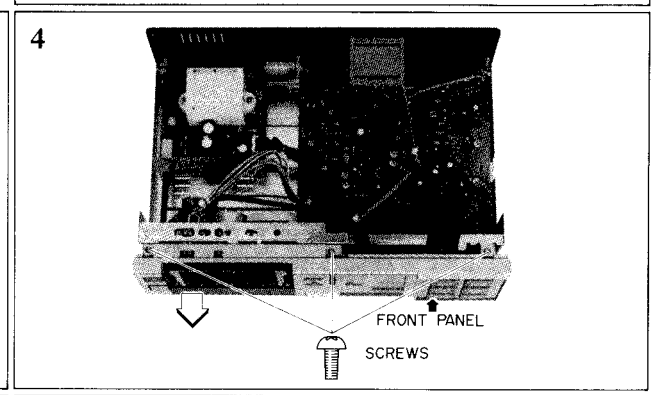
* Noise Reduction manufactured under license from Dolby Laboratories Licensing Corporation. "Dolby" and the double-D symbol are trade marks of Dolby Laboratories Licensing Corporation.

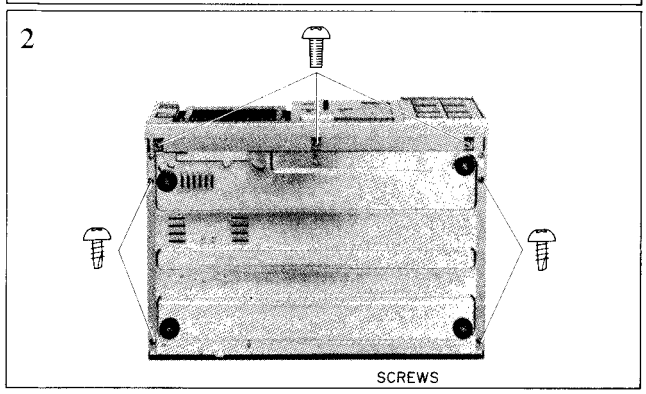
II. DISMANTLING OF UNIT

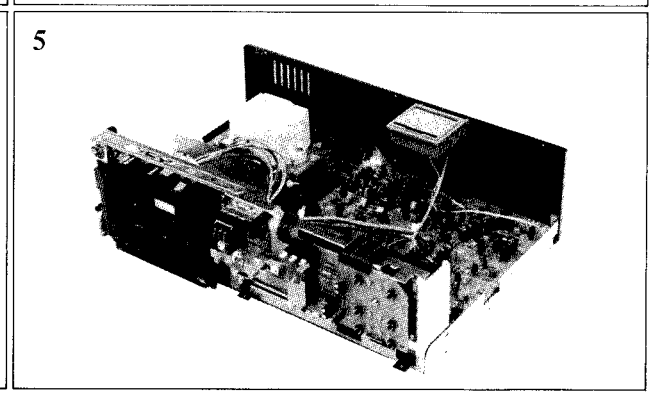
In case of trouble, etc. necessitating dismantling, please dismantle in the order shown in the photographs. Reassemble in reverse order.











III. CONTROLS

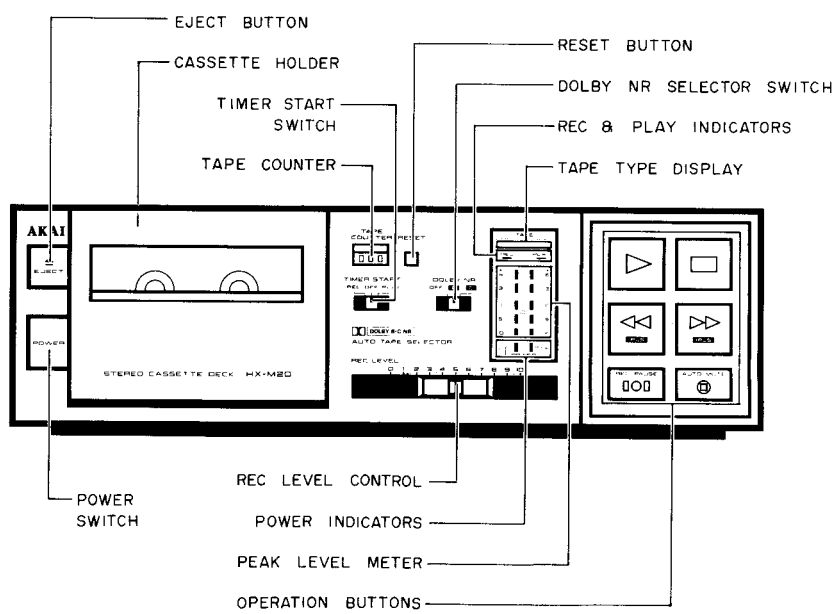


Fig. 3-1

IV. PRINCIPAL PARTS LOCATION

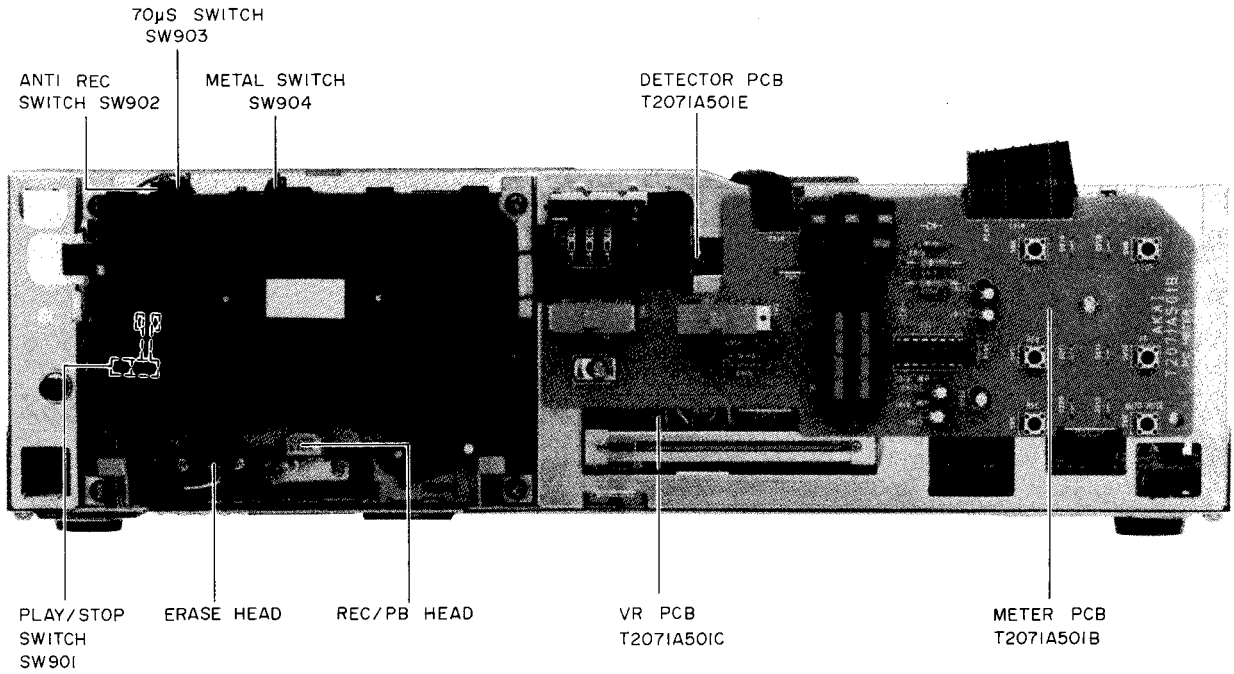


Fig. 4-1

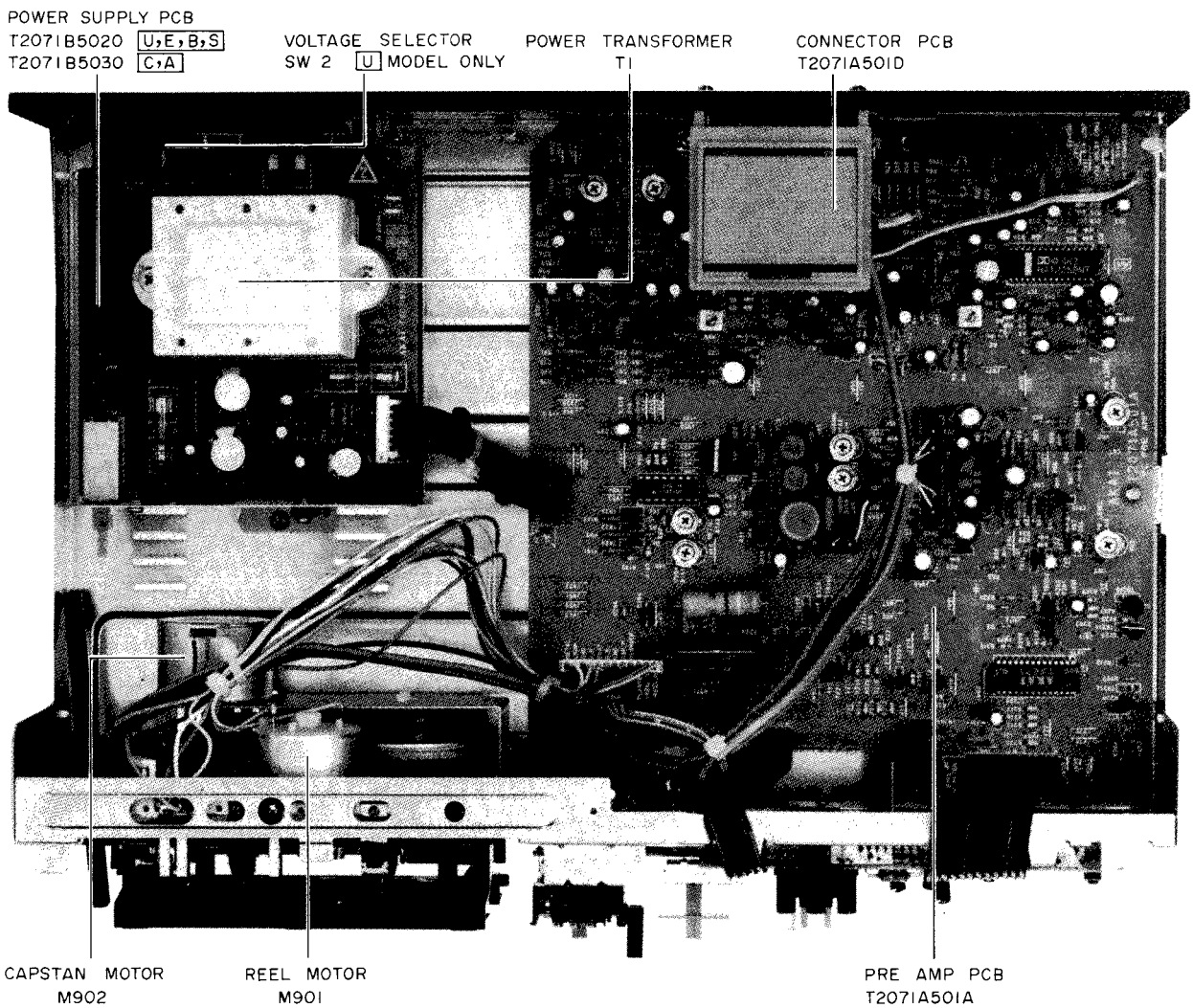


Fig. 4-2

V. MECHANICAL ADJUSTMENT

5-1. PINCH ROLLER PRESSURE MEASUREMENT

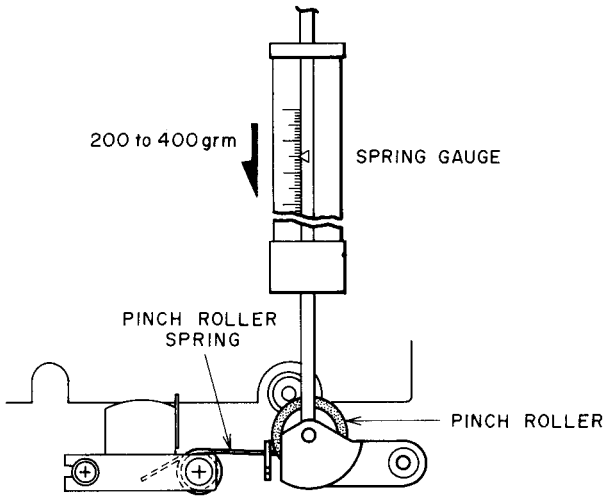


Fig. 5-1

Put in PLAY mode. Push pinch roller arm down with the spring gauge, push the pinch Roller 1 to 2 mm from the Capstan and release slowly. Read the spring gauge at the moment the pinch roller touches the capstan and begins to rotate. Specified contact pressure measurement. If there is no measurement obtained Adjust or Replace the pinch roller spring.

300 to 500 grm

5-2. WINDING TORQUE MEASUREMENT IN EACH MODE

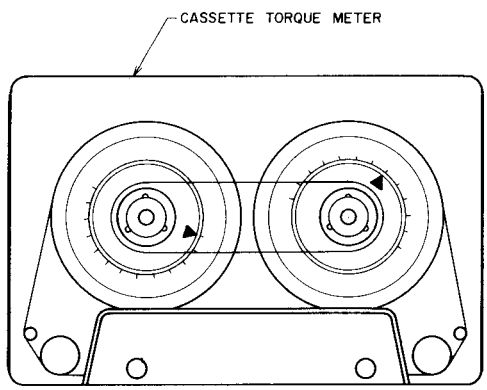


Fig. 5-2

Insert cassette torque meter (AJ-751179) and measure in each mode.

PLAY mode

Take up Torque: 30 to 70 grm-cm

Back tension torque: 1 to 6 grm-cm

FAST FORWARD, REWIND mode

Take up Torque: More than 70 grm-cm

5-3. TAPE SPEED ADJUSTMENT

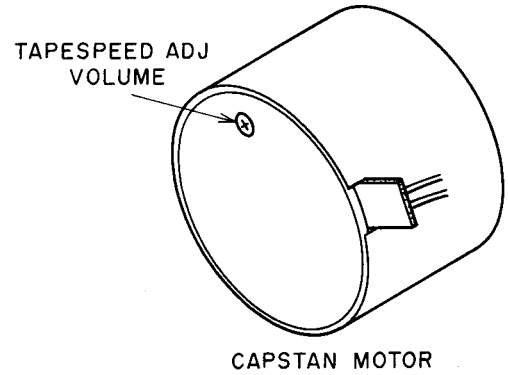


Fig. 5-3

Connect a frequency Counter to Line output terminals. Play Back a 1,000 Hz Tape Speed Test Tape (AT-750774) or 3,150 Hz Tape Speed Test Tape (AT-751263) and adjust a Tape Speed Adjustment Volume (see Fig. 5-3) to obtain a tape speed of 1,000 ± 10 Hz, or 3,150 ± 30 Hz.

5-4. REC/PB HEAD AZIMUTH ADJUSTMENT

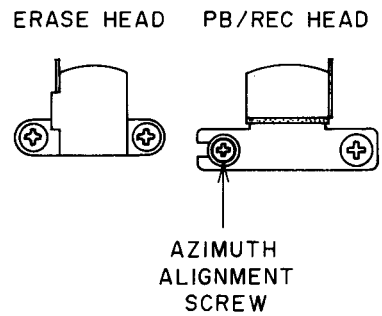


Fig. 5-4

Play Back a 10 kHz Azimuth Alignment tape (AT-750778) and Adjust the Azimuth Alignment Screw, until the output levels of both channels are maximum. After Adjustment, Paintlock the Azimuth Alignment Screw.

VI. PRE-AMPLIFIER ADJUSTMENT

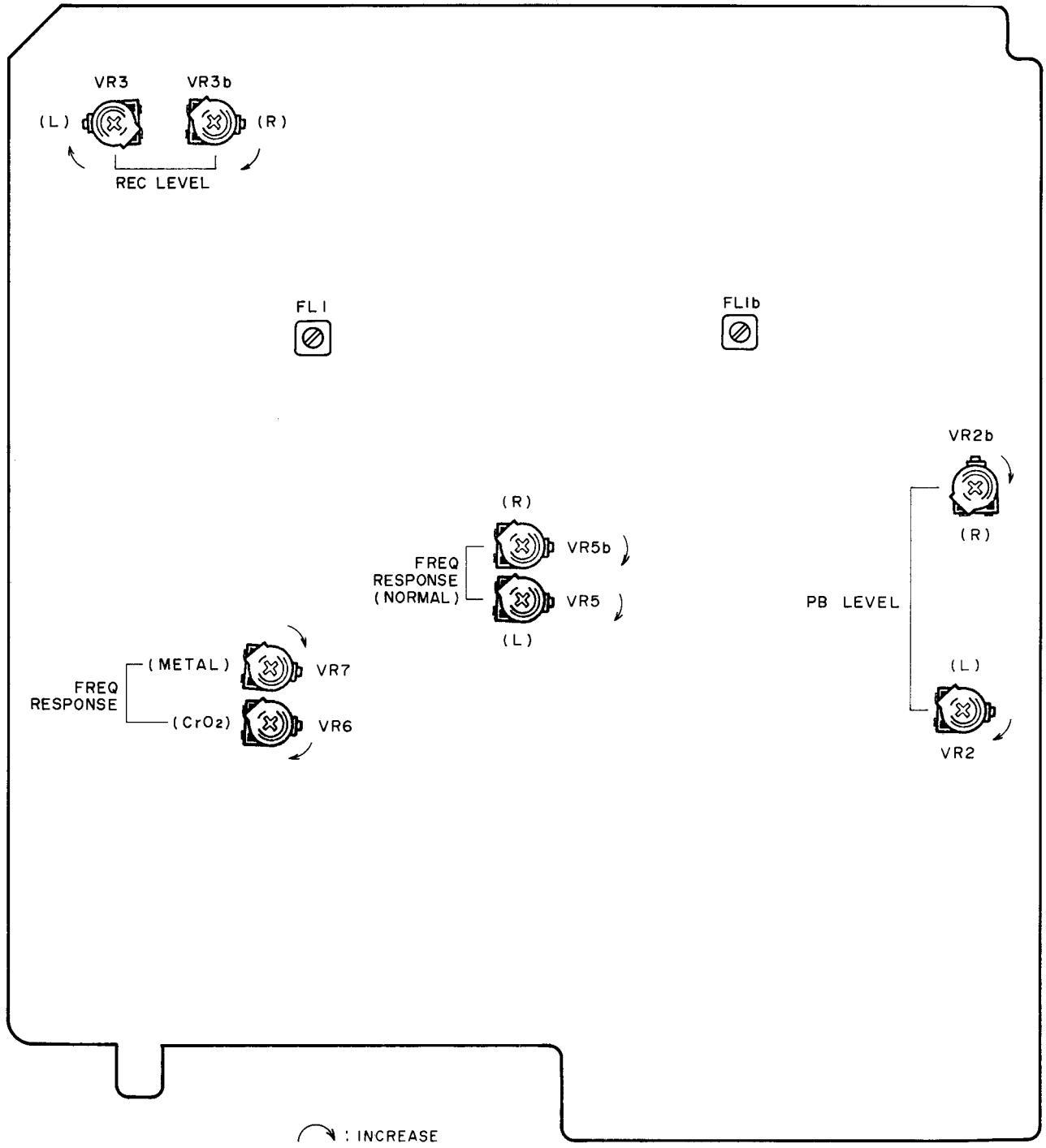


Fig. 6-1 Pre-Amp PCB ADJ Points

Step	Adjustment Item	Test Tape & Supply Signal	Mode	Adjustment Parts	Result	Remarks
1	PB LEVEL	315 Hz	PB	VR 1 (Lch) VR 1b (Rch)	−6.0±0.2 dBm	
2	NORMAL POSITION FREQUENCY RESPONSE	NORMAL Blank Tape 1 kHz, 10 kHz −26.0 dBm	REC/PB	VR 5 (Lch) VR 5b (Rch)	1 kHz, 10 kHz −26.0±0.5 dBm	
3	CrO_2 POSITION FREQUENCY RESPONSE	CrO_2 Blank Tape 1 kHz, 10 kHz −26.0 dBm	REC/PB	VR 6	1 kHz, 10 kHz −26.0±0.5 dBm	
4	METAL POSITION FREQUENCY RESPONSE	METAL Blank Tape 1 kHz, 10 kHz −26.0 dBm	REC/PB	VR 7	1 kHz, 10 kHz −26.0±0.5 dBm	
5	REC LEVEL	NORMAL Blank Tape 315 Hz −6.0 dBm	REC/PB	VR 3 (Lch) VR 3b (Rch)	−6.0±0.2 dBm	

NOTES: 1. All adjustments are without Dolby.
2. Use the following cassette measuring tapes:
NORMAL TAPE : Maxell UDI C-60
CrO_2 TAPE : TDK SA C-60
METAL TAPE : TDK MA C-60

VII. PC BOARD TITLES AND IDENTIFICATION NUMBERS

PC Board Title	PC Board Number	Remark
PRE-AMP PC Board	T2071A501A	
METER PC Board	T2071A501B	
VR PC Board	T2071A501C	
CONNECTOR PC Board	T2071A501D	
DETECTOR PC Board	T2071A501E	
POWER SUPPLY PC Board	T2071B5020	U, E, B, S
POWER SUPPLY PC Board	T2071B5030	C, A

SECTION 2

PARTS LIST

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4. METER PC BOARD 16
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6. DETECTOR PC BOARD 16
7. VOLUME PC BOARD 16
8. ASSEMBLY BLOCK 16
9. FINAL ASSEMBLY BLOCK 18
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Resistors and Capacitors which are not listed in this parts list, please refer to COMMON LIST FOR SERVICE PARTS.

ATTENTION

1. **When placing an order for parts, be sure to list the parts no. model no., and description of each part. If any of this information is omitted, there are instances in which parts cannot be shipped or the wrong parts will be delivered.**
2. **Please be careful not to make a mistake in the parts no. If the parts no. is in error, a part different from the one ordered may be delivered.**
3. **Because part numbers and part definitions and supply in the Preliminary Parts List may have been the subject of changes, please use this parts list for all future reference.**

HOW TO USE THIS PARTS LIST

1. This Parts List shows those parts which are considered necessary for repairs. Other parts, such as resistors and capacitors, are shown in the "Common List for Service Parts" from which these parts should be selected and parts.
2. The Recommended Spare Parts List shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not in principle be supplied.
4. How to read the parts list

a) Mechanism Block

2. HEAD BASE BLOCK

REF. NO.	PART NO.	DESCRIPTION
2-1x	BH-T2023A320A	HEAD BASE BLOCK GX-F66R
2-2	HP-H2206A010A	HEAD R/P PR4-8FU C
2-3	ZS-477876	PAN20×03STL CMT
2-4	ZS-536488	BID20×08STL CMT
2-5	ZG-402895	CS ANGLE ADJUST SPRING

SP (Service Parts) Classification

A small "x" indicates the inability to show that particular part in the Photo or Illustration.

This number corresponds with the individual parts index number in that figure

This number corresponds with the Figure Number

b) P.C Board Block

6. SYS. CON. P C BOARD BLOCK

REF. NO.	PART NO.	DESCRIPTION
6-1	BA-T2034A070A	PC SYS CON BLK GX-F44R
6-IC1	EI-324536	IC HD14049BP
6-IC2	EI-336801	IC MB8841-564M
6-IC3	EI-331661	IC SN7405N
6-IC4	EI-336725	IC M54527P
6-TR1to4	ET-200985	TR 2SC2603 F,G
6-TR5to28	ET-554657	TR 2SA733A P,Q
6-D1	ED-318292	D SILICON H 1S2473T-77 T26
6-D2to4	ED-308952	D GERMA V 1K34A-LR F07
6-D5to10	ED-318292	D SILICON H 1S2473T-77 T26
6-X1	EI-318384	OSC X'TAL NC-18C 3.579545MHZ

SP (Service Parts) Classification

These reference symbols correspond with component symbols in the Schematic Diagrams.

5. The kind of part and its installation position can both be determined by the Part Number. To determine where a part number is listed, utilize the Parts Index at the end of the Parts List. It is necessary first of all to find the Part Number. This can be accomplished by using the Reference Number listed at the right of the part number in the Parts Index.

WARNING

⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURE'S RECOMMENDED PARTS

AVERTISSEMENT

⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

RECOMMENDED SPARE PARTS

Because, if the parts listed below are on hand, almost any repair can be accomplished, we suggest that you stock these Recommended Spare Parts Items.

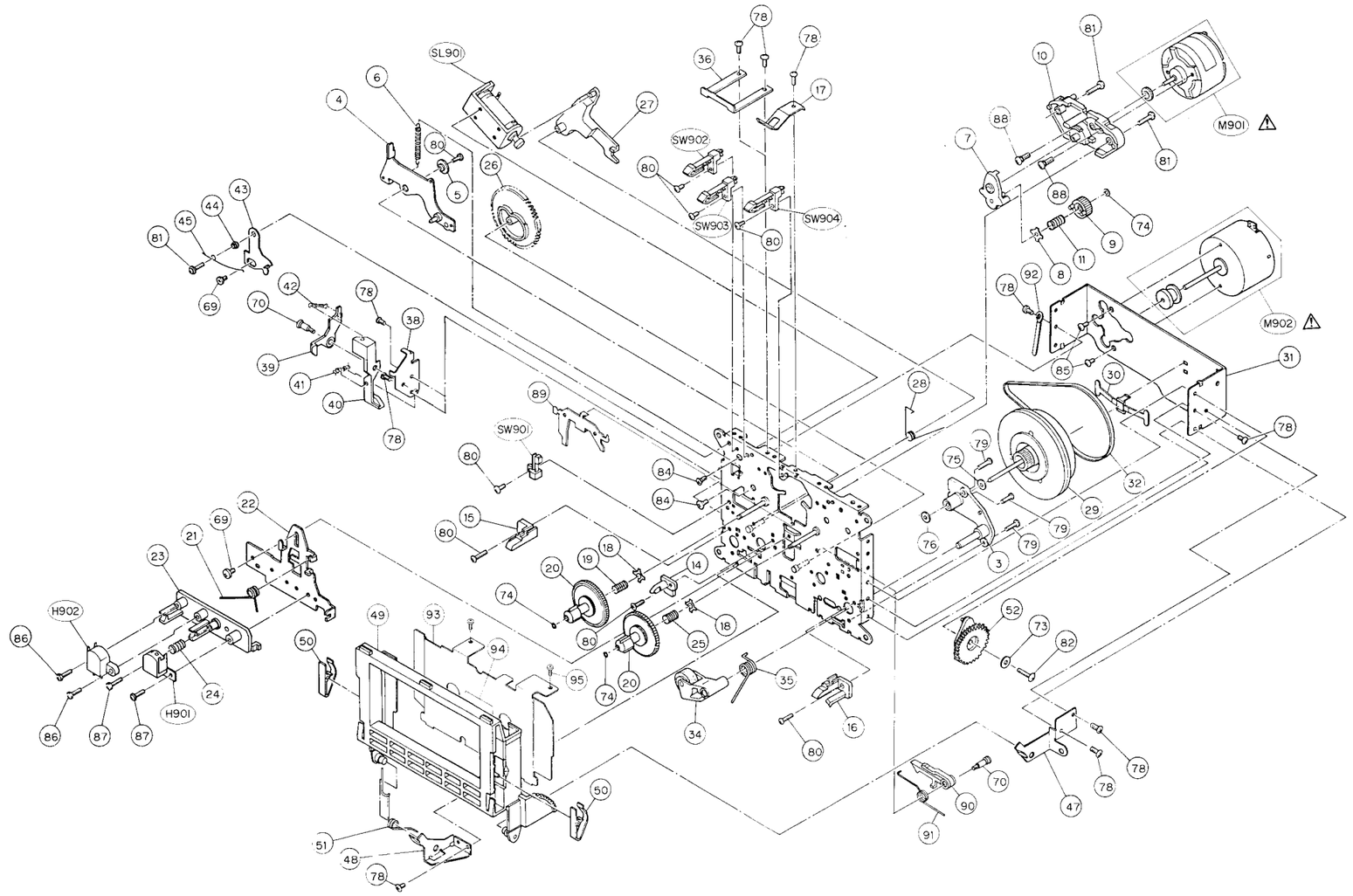
NO.		PART NO.	DESCRIPTION
1	N	BT-357697	⚠ TRANS POWER T2071 (A,C)
2	N	BT-357698	⚠ TRANS POWER T2071 (E,V)
3	N	BT-357696	⚠ TRANS POWER T2071 (U)
4	N	BT-357699	⚠ TRANS POWER T2071 (B,S)
5		ED-330319	⚠ D SILICON DBA10B 100/1.0A
6		ED-346616	⚠ D ZENER H HZ12 B3
7		ED-351901	D LED GL-104H50 YELLOW
8	N	ED-357691	D LED GL-9HY23 YELLOW
9		ED-351881	D LED GL-9PR23 RED
10		ED-349617	D LED SLP-475B-50 YELLOW
11		ED-349662	D SILICON DS135E-FA6 100/1.0A
12		ED-301911	D SILICON H DS448
13		ED-344280	D SILICON H GMA-01-FY2 F05
14	N	ED-346599	D ZENER H HZ4 C3
15		ED-309069	D ZENER H HZ6 B2
16		ED-337265	D ZENER H HZ6 C2
17	N	EF-341264	⚠ FUSE GGS A 125V 1.60A [C,A]
18		EF-318608	⚠ FUSE GGS A 250V 1.00A [C,A]
19		EF-623103	⚠ FUSE SEMKO T 1.00A 250V [U,E,B,S]
20		EF-601942	⚠ FUSE SEMKO T 630MA 250V [U,E,B,S]
21		EH-328491	FILTER DB D07-003K 100KHZ
22		EI-349590	IC BA3280EC
23		EI-330352	IC BA6109
24		EI-355595	IC HA12058NT
25		EI-353289	IC IR2E27A
26	N	EI-358774	IC LM6413E-542
27	N	EI-357498	IC M51143AL
28		EI-349388	IC M54418P
29		EJ-351021	SOCKET CONNECTER M1701 12P
30		EJ-356521	SOCKET CONNECTER-B M1701-A 12P
31	N	EO-357690	COIL OSC1 32-5029-12 100.0KHZ
32	N	EP-715946	SOLENOID
33		ER-348272	⚠ R FUSE ERD2FC S10 1/4W 12R0G
34		ES-337902	⚠ SW PUSH SDLD1P002 01-1
35		ES-344274	⚠ SW SELECTOR HXW0244-01-060 01-4 [U]
36	N	ES-715981	SW LEAF LSA-1120Y
37	N	ES-715980	SW LEAF MSW-1537N
38		ES-344281	SW SLIDE SSSY02109A 02-03N
39		ES-349367	SW TACT SKHHAB044A
40		ET-354083	⚠ TR 2SD1189 Q,R
41		ET-345091	PHOTO SENSOR SPI-201-40 B,C
42		ET-308472	TR 2SA1115 E,F,G
43		ET-348950	TR 2SA1345
44	N	ET-355626	TR 2SA992 E,F
45		ET-348931	TR 2SB774 R,S,T
46		ET-347143	TR 2SC1845 E,F
47		ET-308977	TR 2SC2274K F
48		ET-349705	TR 2SC2320 E,F,G
49		ET-349272	TR 2SC3242A E,F
50		ET-349081	TR 2SC3383 S,T
51		ET-350795	TR 2SC3399
52		ET-349592	TR 2SC3400
53		ET-349366	TR 2SC3402
54		ET-347961	TR 2SD1012-V G
55		ET-338324	TR 2SD1012-V H
56		ET-353316	TR 2SD313 D,E
57		ET-310148	TR 2SD612K E,F
58		EV-337996	R S-FIX H RVF8P01 3P 104
59		EV-345781	R S-FIX H RVF8P01 3P 202
60		EV-337993	R S-FIX H RVF8P01 3P 203
61		EV-338588	R S-FIX H RVF8P01 3P 503
62	N	EV-357689	VR SLIDE 60P2SVOL A503
63		HE-337047	HEAD E HAJAB3040A C
64		HP-712824	HEAD R/P HY424528 SVK
65	N	MB-715967	BELT CAPSTAN (A)
66	N	MB-357581	BELT 0.8×D54.3 CR HS65
67	N	MC-357702	COUNTER MK395-057
68	N	MI-715949	IDLER ARM ASSY
69	N	MZ-715952	GEAR IDLER
70	N	MZ-715962	GEAR PLAY

"NOTE" N: New Parts

SYMBOL FOR DESTINATION

[A] : AAL (U.S.A)
[B] : UK (England)
[C] : CSA (Canada)
[E] : CEE (Europe)
[S] : SAA (Australia)
[U] : U/T (Universal Area)
[V] : VDE (West Germany)

MECHA GT-8000F BLOCK



1. MECHA GT-8000F BLOCK

REF. NO.	PART NO.	DESCRIPTION
		MECHA GT-8000F BLOCK
1-1	BB-357701	MECHA GT-8000F BLK
1-3	MZ-715947	HOUSING ASSY (R)
1-7	MI-715949	IDLER ARM ASSY
1-8	ZW-715951	WASHER IDLER
1-9	MZ-715952	GEAR IDLER
1-11	ZG-715953	SP CLUTCH
1-17	ZG-715954	SP CASSETTE HOLDER
1-18	ZW-715955	WASHER REEL
1-19	ZG-715956	SP REEL
1-20	MT-715957	REEL TABLE
1-21	ZG-715958	SP TORSION (A) HEAD CHASSIS
1-23	HZ-715959	HEAD BASE
1-24	ZG-749268	SP HEAD
1-25	ZG-715960	SP REEL (C)
1-26	MZ-715962	GEAR PLAY
1-27	ML-715963	ARM PL
1-28	ZG-715964	SP ARM PL
1-29	BF-715965	FLYWHEEL ASSY (A)
1-30	ZW-715966	SPACER CAPSTAN

REF. NO.	PART NO.	DESCRIPTION
1-32	MB-715967	BELT CAPSTAN (A)
1-34	BL-715968	PINCH ROLLER ASSY (R)
1-35	ZG-715969	SP PINCH ROLLER (R)
1-39	ML-715970	STOPPER CASSETTE
1-40	ML-715971	EJECTOR
1-41	ZG-715973	SP EJECT (A)
1-42	ZG-715974	SP EJECT (B)
1-45	ZG-715975	SP LOCK ARM
1-49	TC-715976	HOLDER CASSETTE
1-50	ZG-715977	SP PLATE CASSETTE HOLDER
1-51	ZG-715978	SP TORSION
1-52	TC-715979	DAMPER ASSY
1-70	ZS-715982	SCREW (B)
1-74	ZW-715984	PW16×035×050PSL
1-86	ZS-715985	BID20×11
1-87	ZS-715986	BID20×10 W/WASHER
1-90	ML-715987	BRAKE ARM
1-91	ZG-715988	SP BRAKE
1-H901	HP-712824	HEAD R/P HY424528 SVK
1-H902	HE-337047	HEAD E HAJAB3040A C

REF. NO.	PART NO.	DESCRIPTION
1-M901	BM-715990	⚠ REEL MOTOR ASSY W/GEAR RF-510T
1-M902	BM-715989	⚠ MOTOR ASSY W/PULLEY EG500AD-2B
1-SW901	ES-715981	SW LEAF LSA-1120Y
1-SW902	ES-715980	SW LEAF MSW-1537N
1-SW903	ES-715980	SW LEAF MSW-1537N
1-SW904	ES-715980	SW LEAF MSW-1537N
1-SL901	EP-715946	SOLENOID
		ASSEMBLY BLOCK
1-93	TC-357587	DECORATION PLATE
1-94	SZ-357722	REFLECTOR
1-95	ZS-357727	ST PAN20×05STL CMT

NOTE: Parts will not be supplied if they are not listed in the Parts list, even if they appear on the assembling illustrations with reference No.

2. PC BOARD BLOCK

REF. NO.	PART NO.	DESCRIPTION
2-1	BA-T2071A040A	PC PRE AMP BLK HX-M20
2-2A	BA-T2071A030A	PC POWER BLK HX-M20(U) [U]
2-2B	BA-T2071A030B	PC POWER BLK HX-M20(C,A)[C,A]
2-2C	BA-T2071A030C	PC POWER BLK HX-M20(E,B,S) [E,V,B,S]

*NOTE: PC PRE AMP BLK consists of following PC BOARDS.
- PRE AMP PC BOARD
- METER PC BOARD
- DETECTOR PC BOARD
- VOLUME PC BOARD

3. PRE AMP PC BOARD

REF. NO.	PART NO.	DESCRIPTION
3-IC1	EI-355595	IC HA12058NT
3-IC2	EI-349590	IC BA3280EC
3-IC3	EI-357498	IC M51143AL
3-IC4	EI-349388	IC M54418P
3-IC200	EI-358774	IC LM6413E-542
3-IC201	EI-330352	IC BA6109
3-TR1	ET-349081	TR 2SC3383 S,T
3-TR3	ET-349705	TR 2SC2320 E,F,G
3-TR4	ET-349081	TR 2SC3383 S,T
3-TR5	ET-349592	TR 2SC3400
3-TR6	ET-348931	TR 2SB774 R,S,T
3-TR7	ET-349592	TR 2SC3400
3-TR8	ET-348931	TR 2SB774 R,S,T
3-TR9,10	ET-347143	TR 2SC1845 E,F
3-TR11	ET-355626	TR 2SA992 E,F
3-TR12	ET-349366	TR 2SC3402
3-TR13	ET-349081	TR 2SC3383 S,T
3-TR14	ET-349366	TR 2SC3402
3-TR15	ET-349081	TR 2SC3383 S,T
3-TR16	ET-338324	TR 2SD1012-V H
3-TR17	ET-349081	TR 2SC3383 S,T
3-TR18,19	ET-308977	TR 2SC2274K F
3-TR20	ET-353316	TR 2SD313 D,E
3-TR21	ET-349705	TR 2SC2320 E,F,G
3-TR22,23	ET-348950	TR 2SA1345
3-TR24	ET-308472	TR 2SA1115 E,F,G
3-TR200	ET-310148	TR 2SD612K E,F
3-TR202to204	ET-349705	TR 2SC2320 E,F,G
3-TR205	ET-349272	TR 2SC3242A E,F
3-TR206	ET-349705	TR 2SC2320 E,F,G
3-TR207	ET-347961	TR 2SD1012-V G
3-TR208	ET-349705	TR 2SC2320 E,F,G
3-TR209	ET-349366	TR 2SC3402
3-TR210	ET-349705	TR 2SC2320 E,F,G
3-TR211	ET-349366	TR 2SC3402
3-TR212	ET-350795	TR 2SC3399
3-TR213to215	ET-349705	TR 2SC2320 E,F,G
3-D1to5	ED-344280	D SILICON H GMA-01-FY2 F05
3-D200	ED-309069	D ZENER H HZ6 B2
3-D201	ED-344280	D SILICON H GMA-01-FY2 F05
3-D202	ED-346599	D ZENER H HZ4 C3
3-D203	ED-337265	D ZENER H HZ6 C2
3-D204	ED-349662	D SILICON DS135E-FA6 100/1.0A
3-D205to208	ED-344280	D SILICON H GMA-01-FY2 F05
3-D216to218	ED-344280	D SILICON H GMA-01-FY2 F05
3-VR2	EV-338588	R S-FIX H RVF8P01 3P 503
3-VR3	EV-337993	R S-FIX H RVF8P01 3P 203
3-VR5	EV-337996	R S-FIX H RVF8P01 3P 104
3-VR6	EV-337993	R S-FIX H RVF8P01 3P 203
3-VR7	EV-345781	R S-FIX H RVF8P01 3P 202
3-FL1	EH-328491	FILTER DB D07-003K 100KHZ
3-FL2	EO-337044	COIL TUN 1 102AZ-005
3-FL3	EO-315758	COIL TUN 1 100Z-431 100.00KHZ
3-L1	EO-347162	COIL FIX 1 L-8 103J
3-T1	EO-357690	COIL OSC1 32-5029-12 100.0KHZ
3-FR1	ER-348272	⚠ R FUSE ERD2FC S10 1/4W 12R0G
3-R224	ER-358055	⚠ R OMF H S30 FS 3W 390J
3-C60	EC-302265	C STY V S05 CQFS 271J 50DC
3-C91	EC-337005	C PP V F10 ECQ-F 152J 630DC

4. METER PC BOARD

REF. NO.	PART NO.	DESCRIPTION
4-IC7	EI-353289	IC IR2E27A
4-D50to52	ED-349617	D LED SLP-475B-50 YELLOW
4-D53	ED-351881	D LED GL-9PR23 RED
4-D54	ED-357691	D LED GL-9HY23 YELLOW
4-D55,56	ED-351881	D LED GL-9PR23 RED
4-D57	ED-351901	D LED GL-104H50 YELLOW
4-D209to214	ED-344280	D SILICON H GMA-01-FY2 F05
4-SW3,4	ES-344281	SW SLIDE SSSY02109A 02-03N
4-SW5to10	ES-349367	SW TACT SKHHAB044A
4-R160	ER-333607	⚠ R CB H S15 FS RDS 1/2W 121J

5. POWER SUPPLY PC BOARD

REF. NO.	PART NO.	DESCRIPTION
		POWER SUPPLY PC BOARD
5-TR2	ET-349081	⚠ TR 2SC3383 S,T
5-TR3	ET-349705	⚠ TR 2SC2320 E,F,G
5-TR4	ET-308472	TR 2SA1115 E,F,G
5-D1	ED-330319	⚠ D SILICON DBA10B 100/1.0A
5-D2	ED-346616	⚠ D ZENER H HZ12 B3
5-D3	ED-330319	⚠ D SILICON DBA10B 100/1.0A
5-D4	ED-349662	⚠ D SILICON DS135E-FA6 100/1.0A
5-D5	ED-337265	⚠ D ZENER H HZ6 C2
5-D6, D7	ED-301911	⚠ D SILICON H DS448
5-SW1	ES-337902	⚠ SW PUSH SDLD1P002 01-1
5-SW2	ES-344274	⚠ SW SELECTOR HXW0244-01-060 01-4 [U]
5-J1	EJ-310567	⚠ SOCKET INLET 0378PC-GS E 2P [U,E,V,B,S]
5-C1A	EC-320548	⚠ C CE V F 103Z 250AC [U,C,A]
5-C1B	EC-338411	⚠ C CE V FZ 103P 400AC [E,V,B,S]
5-C2	EC-352478	C EC V CUT SE 102M 25.0DC
5-C6	EC-309091	C EC V CUT SE 332M 16.0DC
5-C7	EC-350929	C EC V CUT SE 222M 6.3DC
		ASSEMBLY BLOCK
5-F1A	EF-601942	⚠ FUSE SEMKO T 630MA 250V [U,E,V,B,S]
5-F1B	EF-318608	⚠ FUSE GGS A 250V 1.00A [C,A]
5-F2A	EF-623103	⚠ FUSE SEMKO T 1.00A 250V [U,E,V,B,S]
5-F2B	EF-341264	⚠ FUSE GGS A 125V 1.60A [C,A]

6. DETECTOR PC BOARD

REF. NO.	PART NO.	DESCRIPTION
6-PH1	ET-345091	PHOTO SENSOR SPI-201-40 B,C

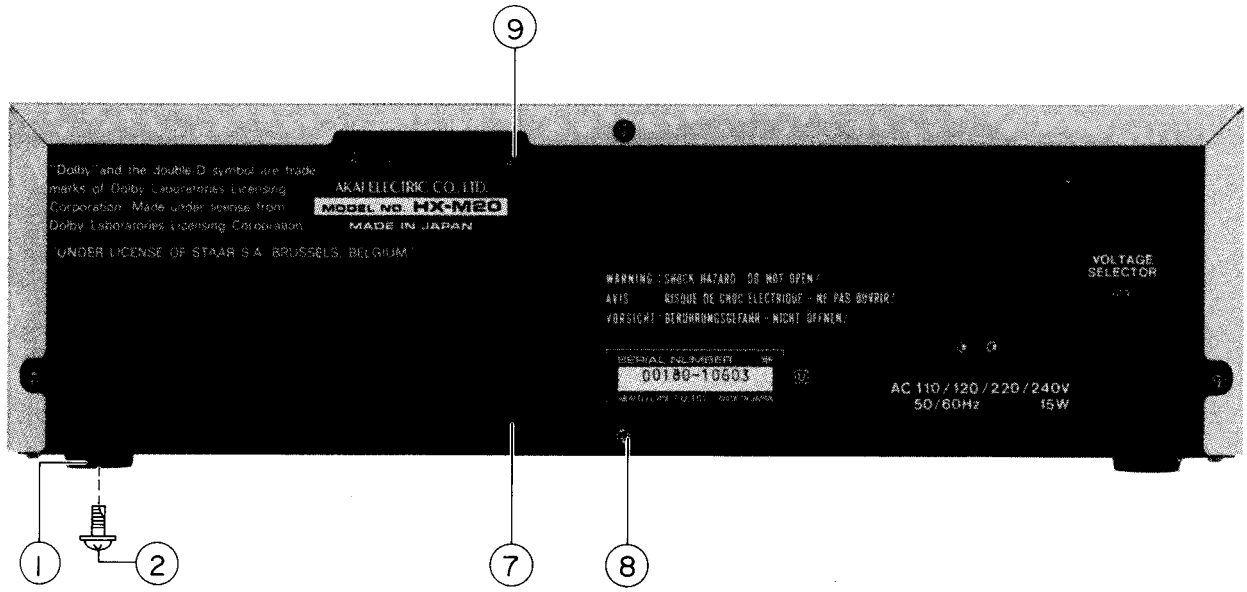
7. VOLUME PC BOARD

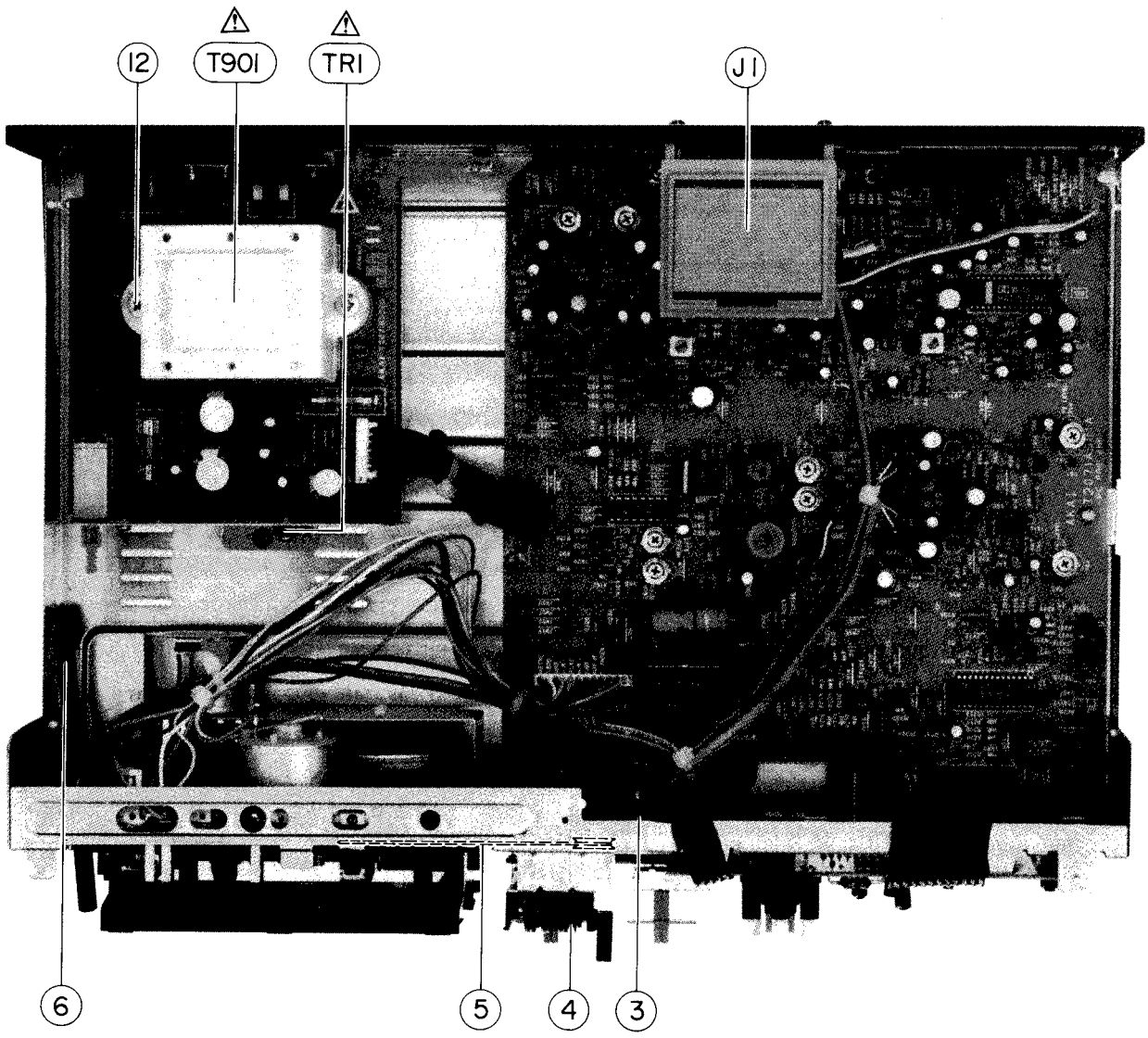
REF. NO.	PART NO.	DESCRIPTION
7-VR1	EV-357689	VR SLIDE 60P2SVOL A503

8. ASSEMBLY BLOCK

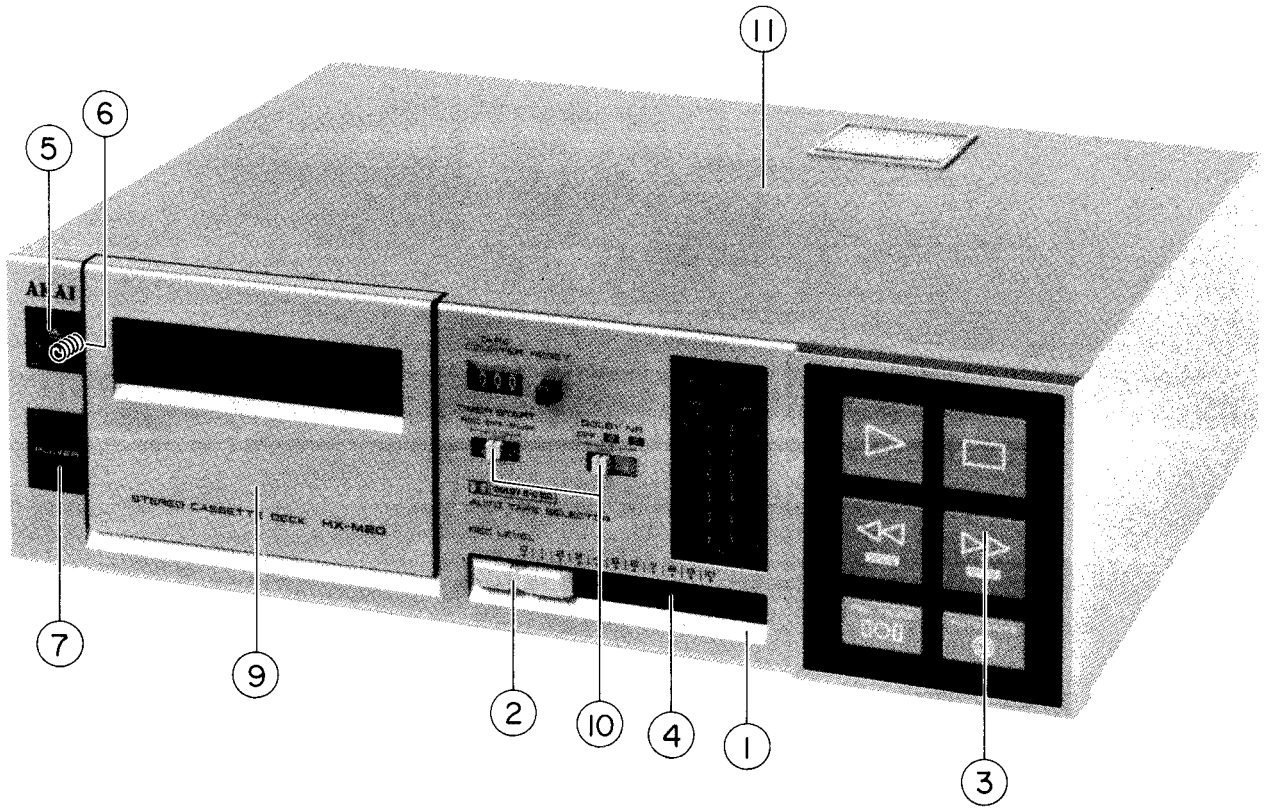
REF. NO.	PART NO.	DESCRIPTION
8-1	SA-349332	FOOT
8-2	ZS-356389	T2 BR30×06STL CMT C080
8-3	ZW-698308	RV NYL30×035 BL
8-4	MC-357702	COUNTER MK395-057
8-5	MB-357581	BELT 0.8×D54.3 CR HS65
8-6	TC-357580	JOINT POWER SW
8-7A	SP-349338S	PANEL REAR HX-M20(U)
8-7B	SP-349338T	PANEL REAR HX-M20(C,A)
8-7C	SP-349338U	PANEL REAR HX-M20(E,V)
8-7D	SP-349338V	PANEL REAR HX-M20(B)
8-7E	SP-349338W	PANEL REAR HX-M20(S)
8-8	ZS-447761	T2BR30×06STL BNI
8-9	ZS-350934	PT BR30×08STL BNI
8-10xA	EW-351111	⚠ AC CORD 2 CORES KP-224/KS15 DK-3 U [U]
8-10xB	EW-347673	⚠ AC CORD 2 CORES SP22-12460/CEE [E,V]
8-10xC	EW-302995	⚠ AC CORD 2 CORES VM0112/OCFL B [B]
8-10xD	EW-322401	⚠ AC CORD 2 CORES KP-560/KS-15 S [S]
8-10xE	EW-359318	⚠ AC CORD 2 CORES KP-8, SPT-1 D-20 UC [C,A]
8-11x	EZ-631945	STRAIN RELIEF SR-4N-4 [C,A]
8-12	ZS-312116	ST BID40×20STL CMT
8-T901A	BT-357696	⚠ TRANS POWER T2071(U)
8-T901B	BT-357697	⚠ TRANS POWER T2071(A,C)
8-T901C	BT-357698	⚠ TRANS POWER T2071(E,V)
8-T901D	BT-357699	⚠ TRANS POWER T2071(B,S)
8-TR1	ET-354083	⚠ TR 2SD1189 Q,R
8-J1	EJ-351021	SOCKET CONNECTER M1701 12P
8-J1B	EJ-356521	SOCKET CONNECTER-B M1701-A 12P

ASSEMBLY BLOCK





FINAL ASSEMBLY BLOCK



9. FINAL ASSEMBLY BLOCK

REF. NO.	PART NO.	DESCRIPTION
	PANEL FRONT BLOCK	
9-1A	BD-T2071A050A	PANEL FRONT BLK HX-M20(U) [U,E,V,B,S]
9-1B	BD-T2071A050B	PANEL FRONT BLK HX-M20(C) [C,A]
9-1C	BD-T2071B050A	PANEL FRON TBLK HX-M20-B(U) [U,E,V,B,S]
9-1D	BD-T2071B050B	PANEL FRONT BLK HX-M20-B(C) [C,A] [BL]
9-2	SK-357583	KNOB REC
9-2B	SK-357583B	KNOB REC-B
9-3A	SK-357582A	KNOB OPERATE [U,E,V,B,S]
9-3B	SK-357582B	KNOB OPERATE-UL [C,A]
9-3C	SK-357582C	KNOB OPERATE-B[U,E,V,B,S][BL]
9-3D	SK-357582D	KNOB OPERATE-B-UL [C,A] [BL]
9-4	SP-357586	HOLDER SCALE
9-5	SK-357584A	KNOB EJECT
9-6	ZG-313182	SP C-04.5/0.35-25.0 C-029
9-7	SK-343017F	KNOB POWER-B

REF. NO.	PART NO.	DESCRIPTION
	FINAL ASSEMBLY BLOCK	
9-8x	ZS-320906	ST BR30x06STL CMT [PANEL FRONT FIX]
9-9	BD-B357589A	LID PART
9-9B	BD-B357589B	LID-B PART
9-10	SK-343090C	KNOB SLIDE (3)
9-11	SP-349334	COVER UPPER
9-11B	SP-349334E	COVER UPPER (3)

NOTE: PANEL FRONT BLK consists of 9-2, 9-3, 9-4, 9-5, 9-6 and 9-7.

SYMBOL FOR COLOR VARIATION

NON: STANDARD COLOR
B or BL: BLACK

INDEX

PART NO.	REF. NO.	PART NO.	REF. NO.	PART NO.	REF. NO.	PART NO.	REF. NO.
BA-T2071A030A	2-2A	ED-351881	4-D56	ET-349081	5-TR2	SK-357584A	9-5
BA-T2071A030B	2-2B	ED-351881	4-D55	ET-349272	3-TR205	SP-349334	9-11
BA-T2071A030C	2-2C	ED-351901	4-D57	ET-349366	3-TR209	SP-349334E	9-11B
BA-T2071A040A	2-1	ED-357691	4-D54	ET-349366	3-TR211	SP-349338S	8-7A
BB-357701	1-1	EF-318608	5-F1B	ET-349366	3-TR12	SP-349338T	8-7B
BD-B357589A	9-9	EF-341264	5-F2B	ET-349366	3-TR14	SP-349338U	8-7C
BD-B357589B	9-9B	EF-601942	5-F1A	ET-349592	3-TR5	SP-349338V	8-7D
BD-T2071A050A	9-1A	EF-623103	5-F2A	ET-349592	3-TR7	SP-349338W	8-7E
BD-T2071A050B	9-1B	EH-328491	3-FL1	ET-349705	3-TR206	SP-357586	9-4
BD-T2071B050A	9-1C	EI-330352	3-IC201	ET-349705	3-TR204	SZ-357722	1-94
BD-T2071B050B	9-1D	EI-349388	3-IC4	ET-349705	3-TR208	TC-357580	8-6
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BL-715968	1-34	EI-353289	4-IC7	ET-349705	3-TR214	TC-715976	1-49
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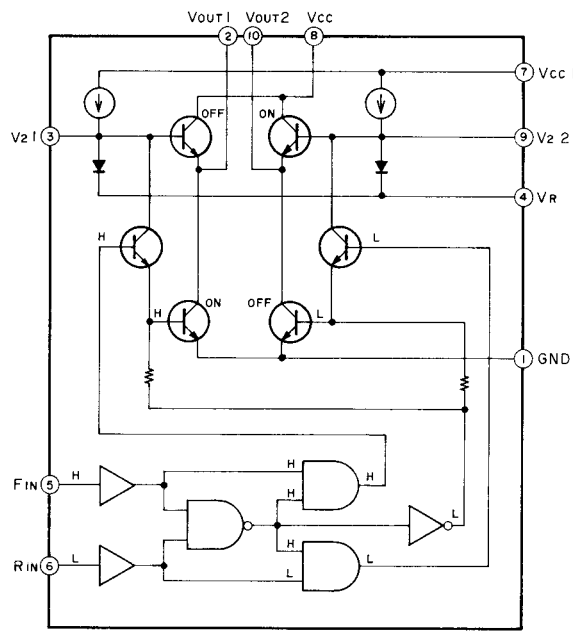
BM-715990	1-M901	EI-357498	3-IC3	ET-349705	3-TR213	ZG-313182	9-6
BT-357696	8-T901A	EI-358774	3-IC200	ET-349705	3-TR3	ZG-715953	1-11
BT-357697	8-T901B	EJ-310567	5-J1	ET-349705	3-TR21	ZG-715954	1-17
BT-357698	8-T901C	EJ-351021	8-J1	ET-349705	3-TR202	ZG-715956	1-19
BT-357699	8-T901D	EJ-356521	8-J1B	ET-349705	3-TR203	ZG-715958	1-21
EC-302265	3-C60	EO-315758	3-FL3	ET-349705	5-TR3	ZG-715960	1-25
EC-309091	5-C6	EO-337044	3-FL2	ET-350795	3-TR212	ZG-715964	1-28
EC-320548	5-C1A	EO-347162	3-L1	ET-353316	3-TR20	ZG-715969	1-35
EC-337005	3-C91	EO-357690	3-T1	ET-354083	8-TR1	ZG-715973	1-41
EC-338411	5-C1B	EP-715946	1-SL901	ET-355626	3-TR11	ZG-715974	1-42
EC-350929	5-C7	ER-333607	4-R160	EV-337993	3-VR3	ZG-715975	1-45
EC-352478	5-C2	ER-348272	3-FR1	EV-337993	3-VR6	ZG-715977	1-50
ED-301911	5-D6	ER-358055	3-R224	EV-337996	3-VR5	ZG-715978	1-51
ED-301911	5-D7	ES-337902	5-SW1	EV-338588	3-VR2	ZG-715988	1-91
ED-309069	3-D200	ES-344274	5-SW2	EV-345781	3-VR7	ZG-749268	1-24
ED-330319	5-D1	ES-344281	4-SW3	EV-357689	7-VR1	ZS-312116	8-12
ED-330319	5-D3	ES-344281	4-SW4	EW-302995	8-10x C	ZS-320906	9-8x
ED-337265	3-D203	ES-349367	4-SW5	EW-322401	8-10x D	ZS-350934	8-9
ED-337265	5-D5	ES-349367	4-SW6	EW-347673	8-10x B	ZS-356389	8-2
ED-344280	3-D1	ES-349367	4-SW7	EW-351111	8-10x A	ZS-357727	1-95
ED-344280	3-D2	ES-349367	4-SW8	EW-359318	8-10x E	ZS-447761	8-8
ED-344280	3-D3	ES-349367	4-SW10	EZ-631945	8-11x	ZS-715982	1-70
ED-344280	3-D4	ES-349367	4-SW9	HE-337047	1-H902	ZS-715985	1-86
ED-344280	3-D5	ES-715980	1-SW903	HP-712824	1-H901	ZS-715986	1-87
ED-344280	3-D201	ES-715980	1-SW902	HZ-715959	1-23	ZW-698308	8-3
ED-344280	3-D205	ES-715980	1-SW904	MB-357581	8-5	ZW-715951	1-8
ED-344280	3-D206	ES-715981	1-SW901	MB-715967	1-32	ZW-715955	1-18
ED-344280	3-D207	ET-308472	3-TR24	MC-357702	8-4	ZW-715966	1-30
ED-344280	3-D208	ET-308472	5-TR4	MI-715949	1-7	ZW-715984	1-74
ED-344280	3-D216	ET-308977	3-TR19	ML-715963	1-27		
ED-344280	3-D217	ET-308977	3-TR18	ML-715970	1-39		
ED-344280	3-D218	ET-310148	3-TR200	ML-715971	1-40		
ED-344280	4-D209	ET-338324	3-TR16	ML-715987	1-90		
ED-344280	4-D210	ET-345091	6-PH1	MT-715957	1-20		
ED-344280	4-D211	ET-347143	3-TR9	MZ-715947	1-3		
ED-344280	4-D212	ET-347143	3-TR10	MZ-715952	1-9		
ED-344280	4-D213	ET-347961	3-TR207	MZ-715962	1-26		
ED-344280	4-D214	ET-348931	3-TR8	SA-349332	8-1		
ED-346599	3-D202	ET-348931	3-TR6	SK-343017F	9-7		
ED-346616	5-D2	ET-348950	3-TR23	SK-343090C	9-10		
ED-349617	4-D50	ET-348950	3-TR22	SK-357582A	9-3A		
ED-349617	4-D51	ET-349081	3-TR1	SK-357582B	9-3B		
ED-349617	4-D52	ET-349081	3-TR4	SK-357582C	9-3C		
ED-349662	3-D204	ET-349081	3-TR17	SK-357582D	9-3D		
ED-349662	5-D4	ET-349081	3-TR13	SK-357583	9-2		
ED-351881	4-D53	ET-349081	3-TR15	SK-357583B	9-2B		

AKAI

MODEL HX-M20

SCHEMATIC DIAGRAM AND PC BOARDS

BA6109



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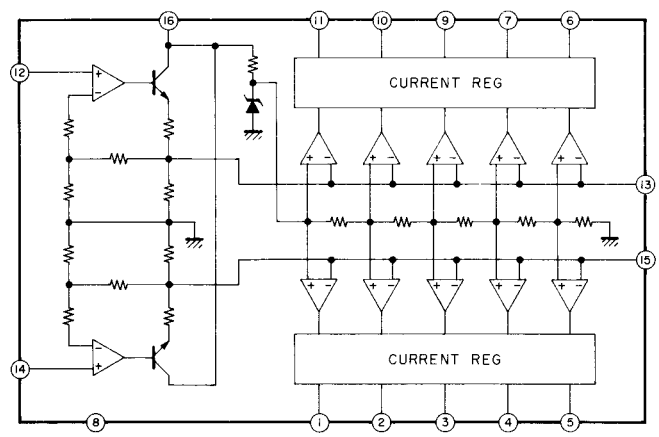
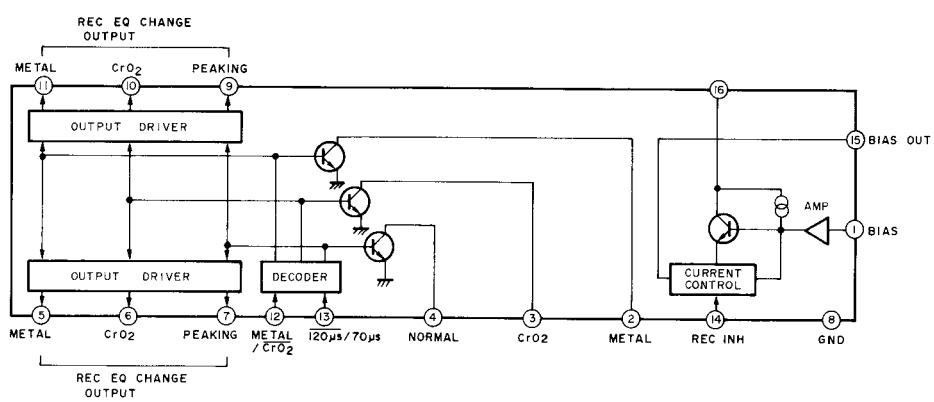
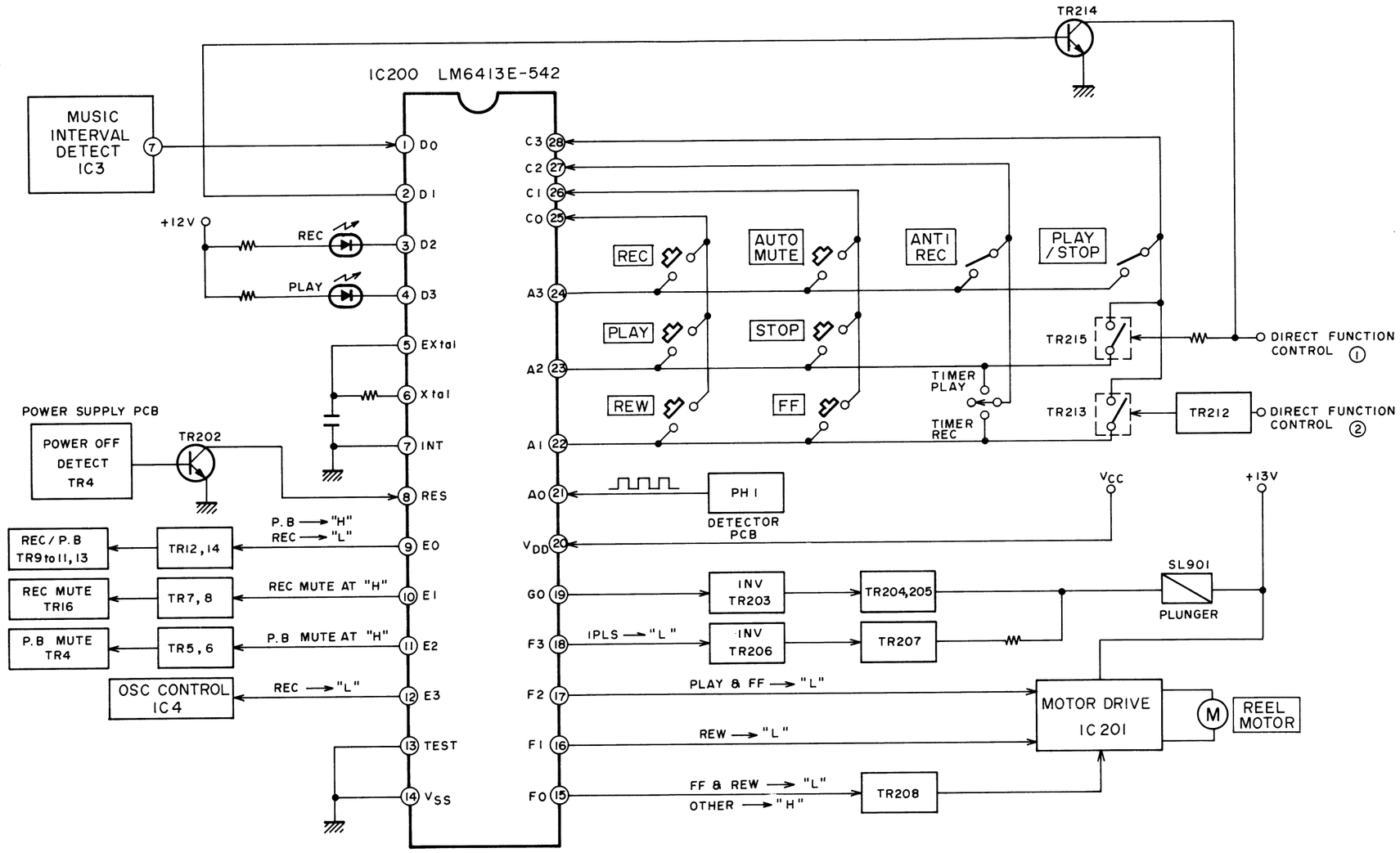


LM6413E-542

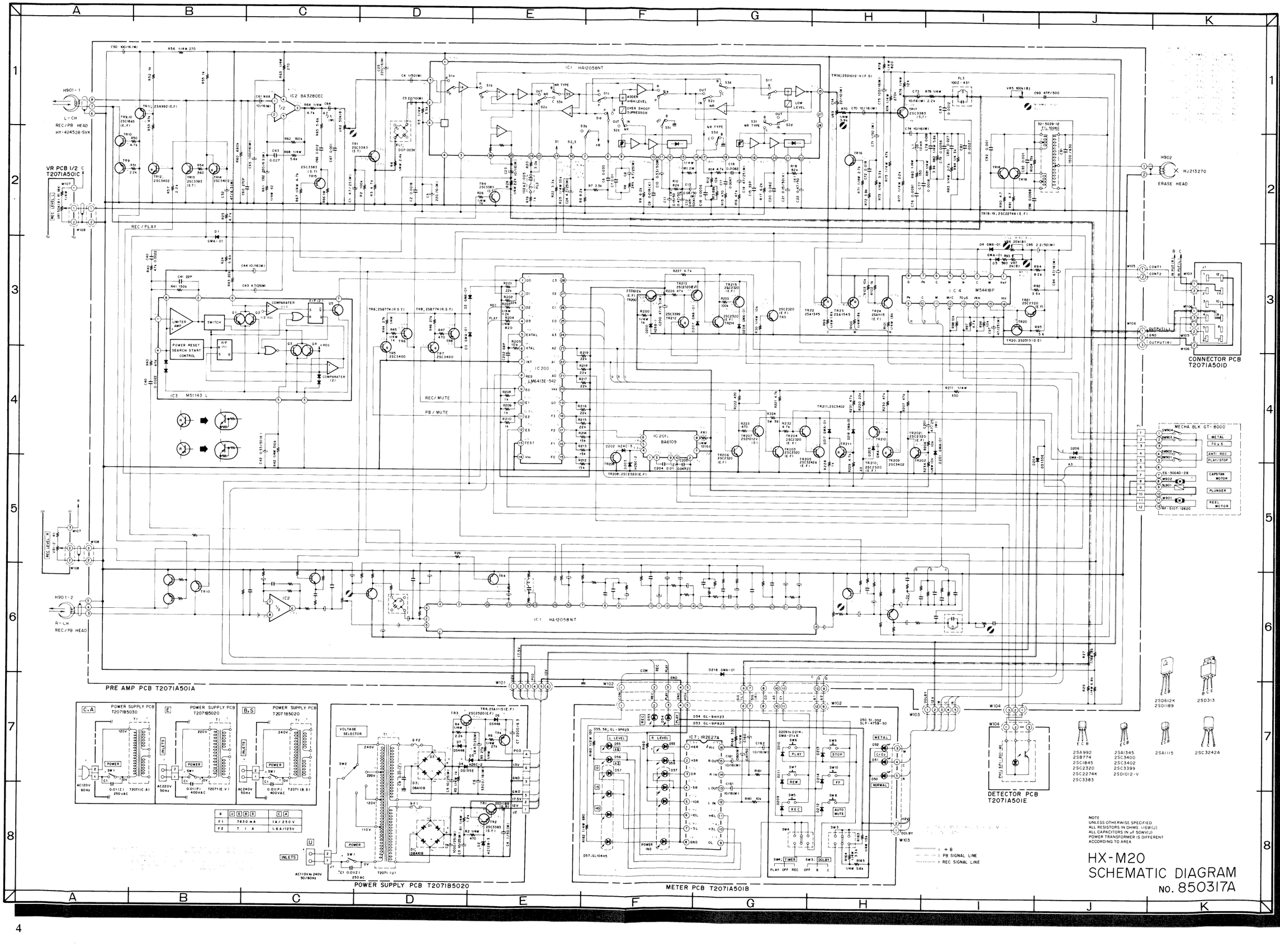
Pin No.	Symbol	Description
1	D0	Music Interval Signal Input
2	D1	Direct Function Control Signal Output
3	D2	REC LED Drive
4	D3	Play LED Drive
5	EX'tal	C & R terminal for clock OSC
6	X'tal	
7	$\overline{INT}$	Connect to Ground
8	$\overline{RESET}$	RESET Terminal
9	E0	REC/P.B Control Signal REC → "L" P.B → "H"
10	E1	REC MUTE Control Signal When REC MUTE → "H"
11	E2	P.B MUTE Control Signal When P.B MUTE → "H"
12	E3	OSC Control Signal When REC → "L"
13	TEST	Connect to Ground
14	VSS	Connect to Ground
15	F0	FF. and REW mode → "L" OTHER mode → "H"
16	F1	Reel Motor Direction Control Signal When REW → "L"
17	F2	Reel Motor Direction Control Signal When FF and PLAY → "L"
18	F3	IPLS mode → "L"
19	G0	Plunger Control
20	VDD	+5V
21	A0	Input Pulse of Auto Stop Detect
22	A1	Strob Data for Key Matrix
23	A2	
24	A3	
25	C0	Input for Key Matrix
26	C1	
27	C2	
28	C3	

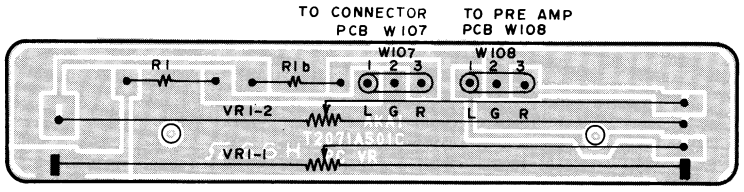
M54418P



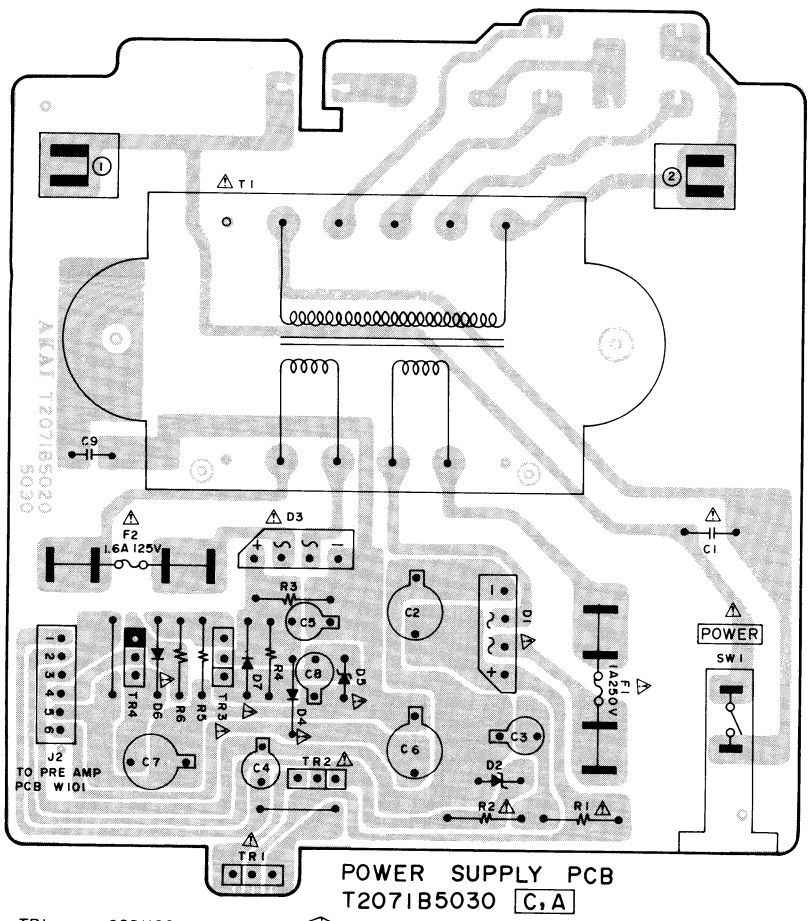


BLOCK DIAGRAM


H901-1
L-CH
REC/PB HEAD
HY-424528-SVK
VR PCB I/2
T2071A501C
REC/PLAY
REC/MUTE
PB/MUTE
IC1 HA12058NT
IC2 BA3280EC
IC3 M51143L
IC200 LM6413E-542
IC201 BA6109
IC4 M5448BP
IC7 IR2E27A
H902
HJ213270
ERASE HEAD
CONNECTOR PCB
T2071A501D
MECHA BLK GT-8000
METAL
7Φ S
ANTI REC
PLAY/STOP
CAPSTAN MOTOR
PLUNGER
REEL MOTOR
EG-50040-28
MF-510T-12620
H901-2
R-CH
REC/PB HEAD
PRE AMP PCB T2071A501A
POWER SUPPLY PCB T2071B5030
POWER SUPPLY PCB T2071B5020
POWER SUPPLY PCB T2071B5020
DETECTOR PCB
T2071A501E
METER PCB T2071A501B
2SD612K
2SD1189
2SD313
2SA992
2SB774
2SC1845
2SC2320
2SC2274K
2SC3383
2SA1345
2SC3400
2SC3402
2SC3399
2SD1012-V
2SA1115
2SC3242A
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(J)
ALL CAPACITORS IN μF 50WV(J)
POWER TRANSFORMER IS DIFFERENT
ACCORDING TO AREA
: +B
: PB SIGNAL LINE
: REC SIGNAL LINE
HX-M20
SCHEMATIC DIAGRAM
NO. 850317A

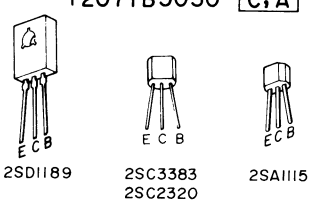


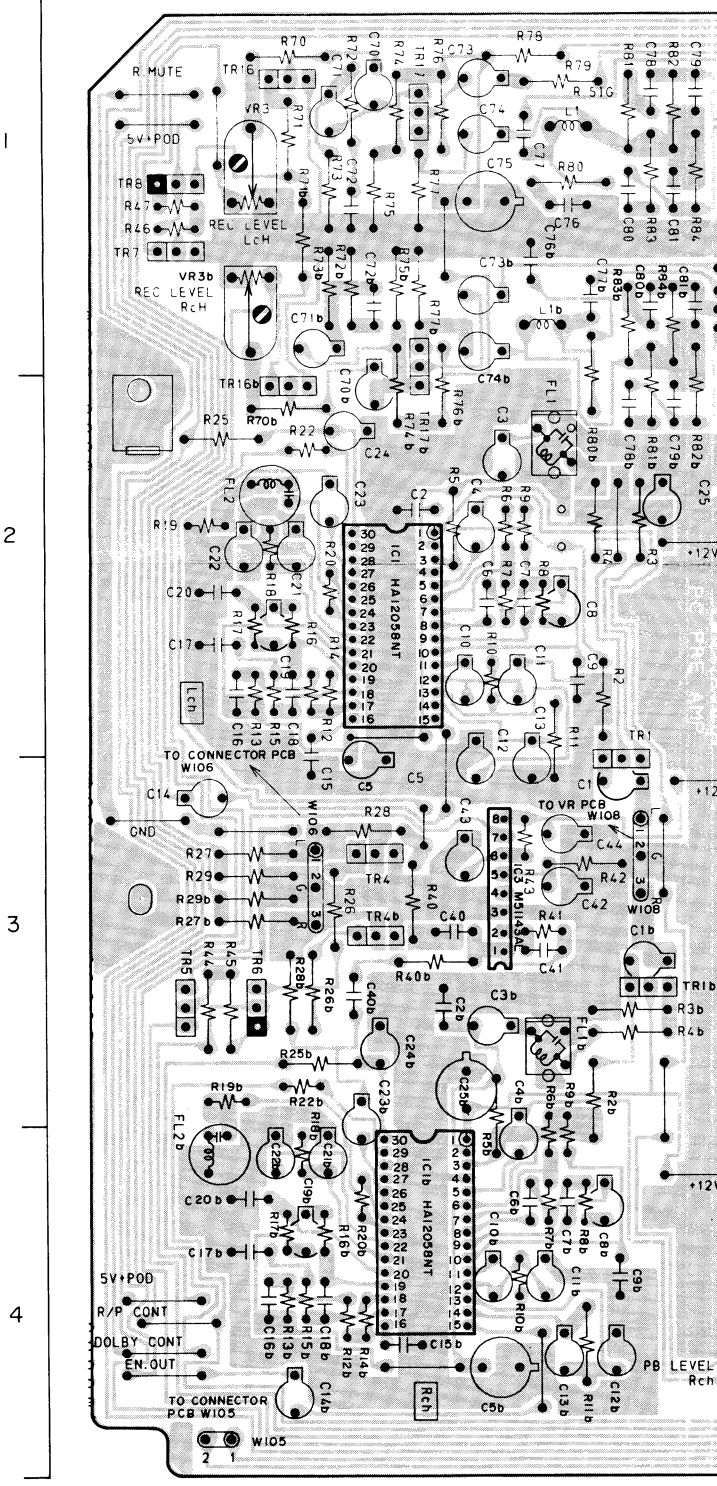
VR PCB T2071A501C



POWER SUPPLY PCB
T2071B5030 C,A

TR1 ------ 2SD1189
TR2 ------ 2SC3383
TR3 ------ 2SC2320
TR4 ------ 2SA1115

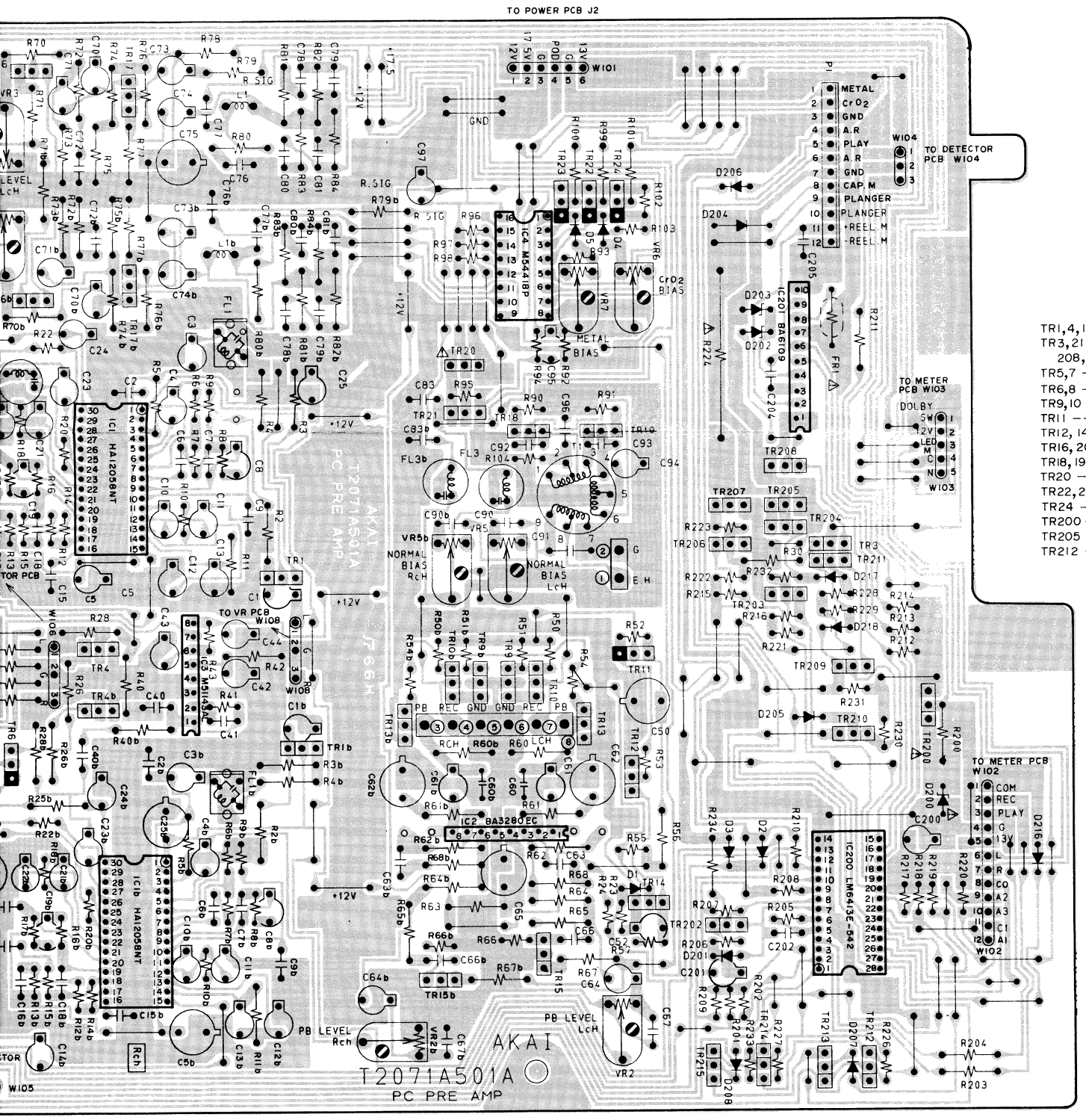




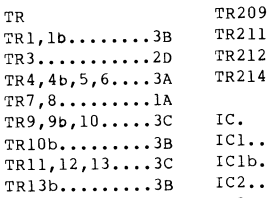
LOCATION OF COMPONENTS

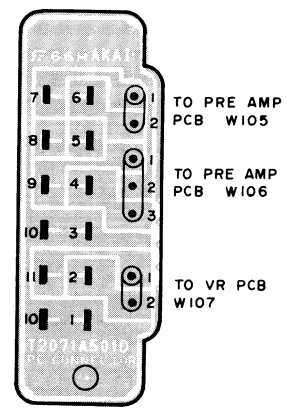
TR	TR209,210.....3D
TR1,1b.....3B	TR211.....2D
TR3.....2D	TR212,213.....4D
TR4,4b,5,6....3A	TR214,215.....4C
TR7,8.....1A	
TR9,9b,10.....3C	IC.
TR10b.....3B	IC1.....2A
TR11,12,13....3C	IC1b.....4A
TR13b.....3B	IC2.....3C
TR14,15.....4C	IC3.....3B
TR15b.....4B	IC4.....1C
TR16,17,17b...1A	IC200.....4D
TR16b.....2A	IC201.....2D
TR18,19.....2C	
TR20,21.....2B	CONNECTOR
TR22,23,24....1C	W101.....1C
TR200.....3D	W102.....4D
TR202.....4C	W103.....2D
TR203.....3D	W104.....1D
TR204,205.....2D	W105.....4A
TR206,207.....2C	W106.....3A
TR208.....2D	W108.....3B

TR1,4,13,15,17 ------- 2SC3383
TR3,21,202 to 204,206,
208,210,213 to 215 --- 2SC2320
TR5,7 ---------- 2SC3400
TR6,8 ---------- 2SB774
TR9,10 ---------- 2SC1845
TR11 ---------- 2SA992
TR12,14,209,211 ---- 2SC340
TR16,207 --------- 2SD1012-V
TR18,19 ---------- 2SC2274K
TR20 ---------- 2SD313
TR22,23 --------- 2SA1345
TR24 ---------- 2SA1115
TR200 ---------- 2SD612K
TR205 ---------- 2SC3242A
TR212 ---------- 2SC3399

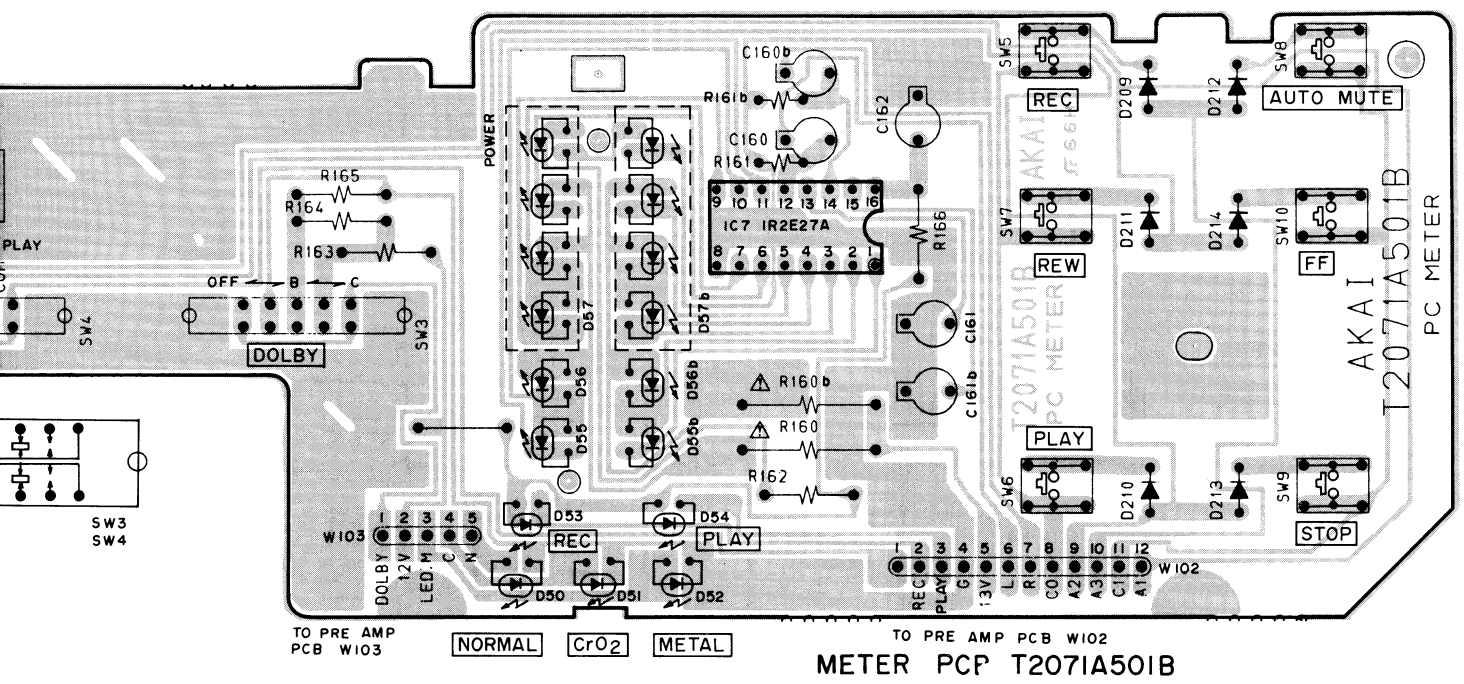


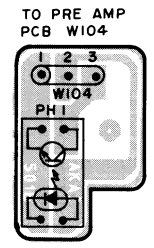
PRE AMP PCB T2071A501A





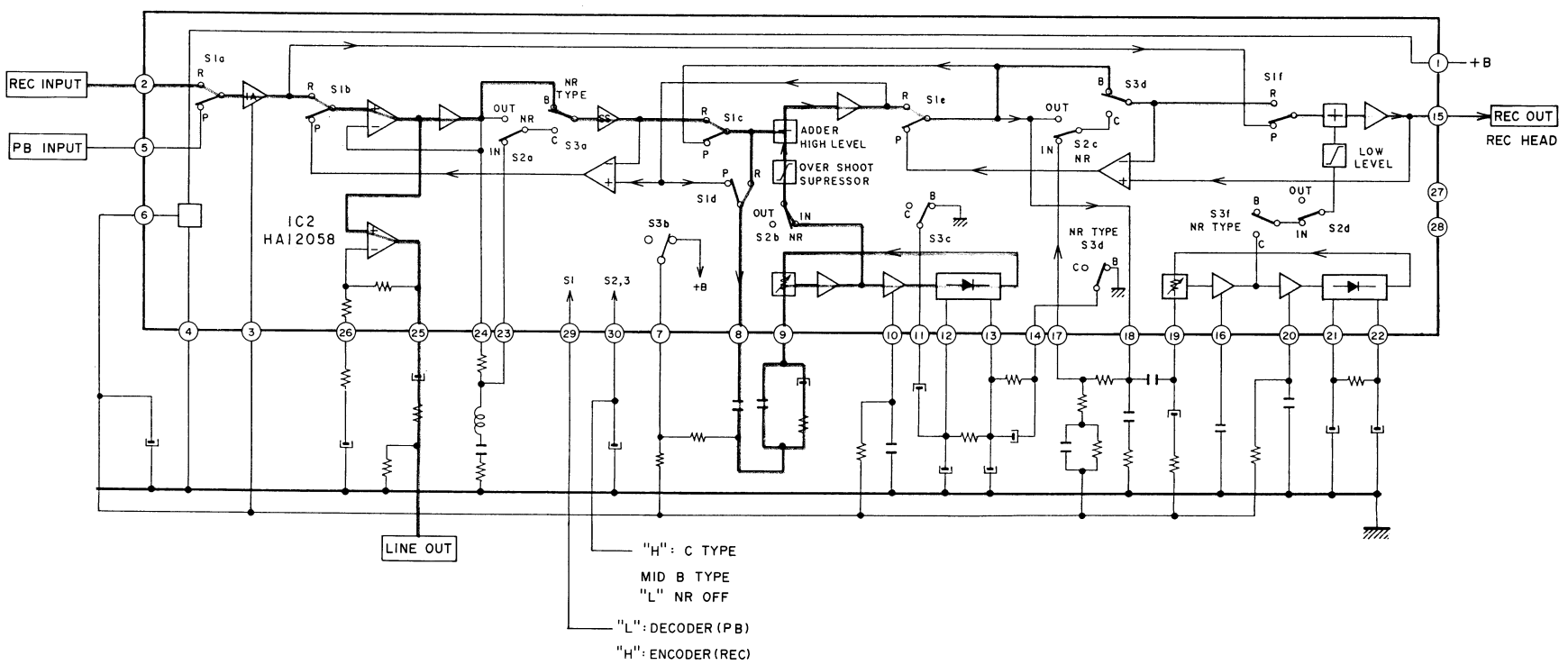
CONNECTOR PCB
T2071A501D



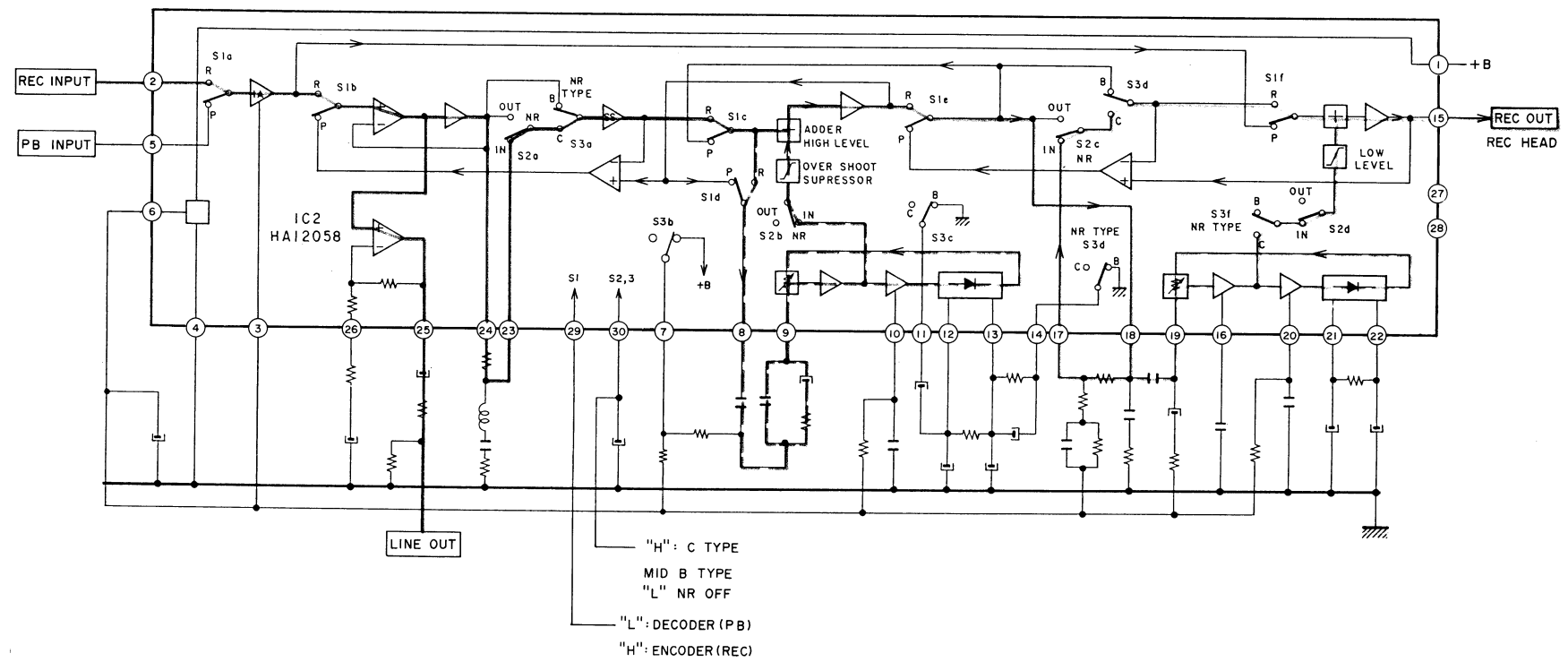


DETECTOR PCB
T2071A501E

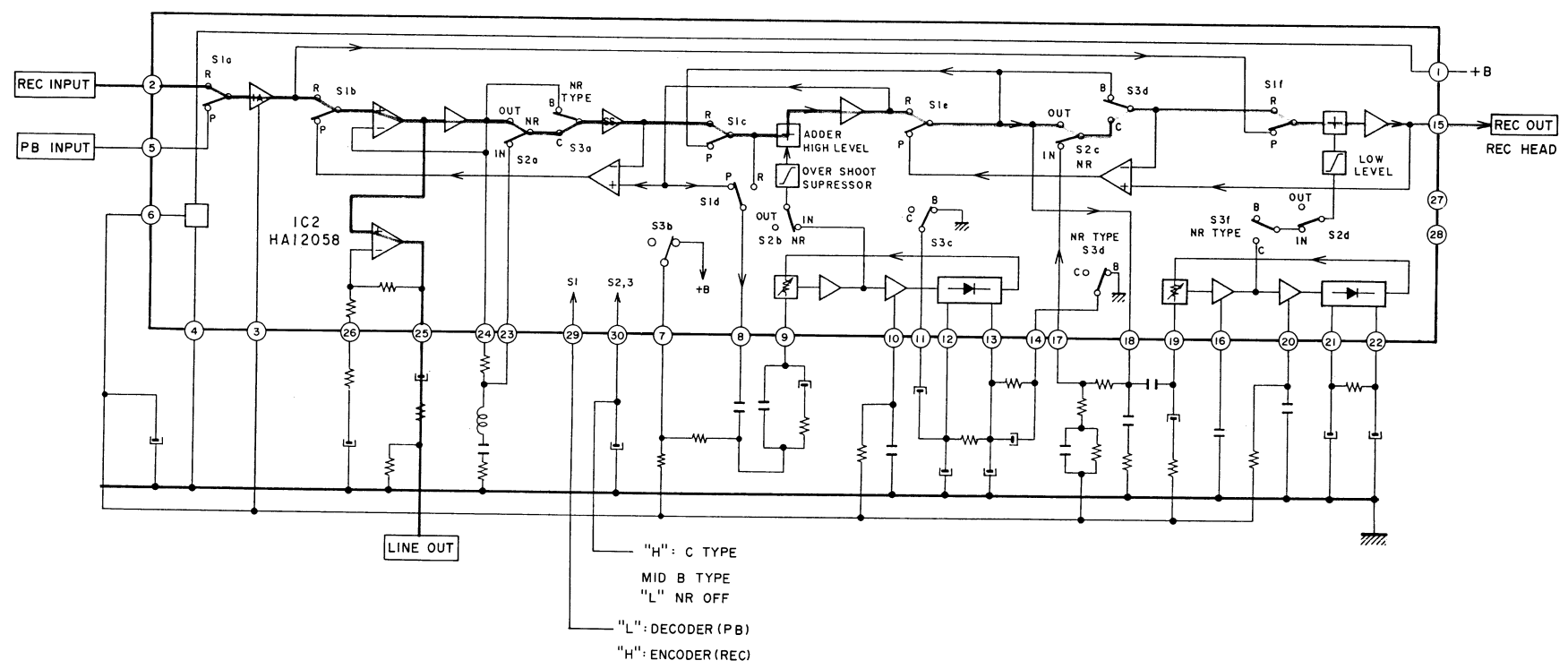
DOLBY B "ON" REC MODE



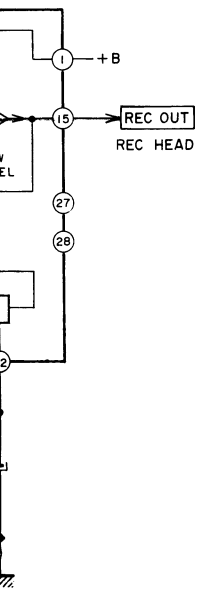
DOLBY C "ON" REC MODE

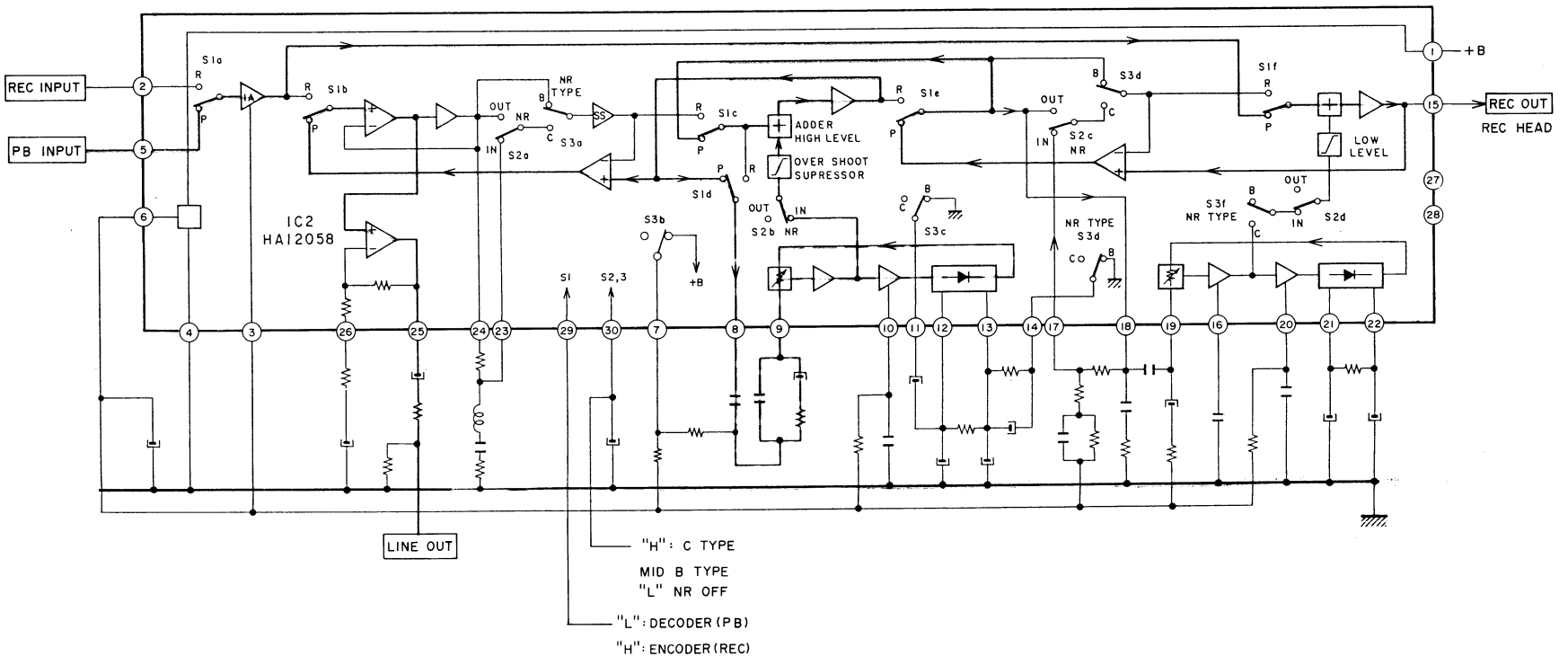


DOLBY "OFF" REC MODE

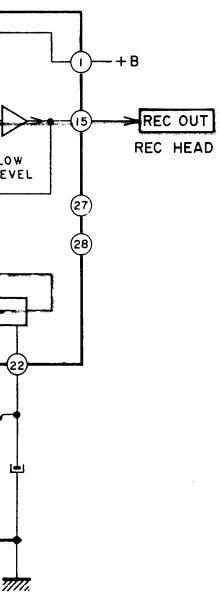


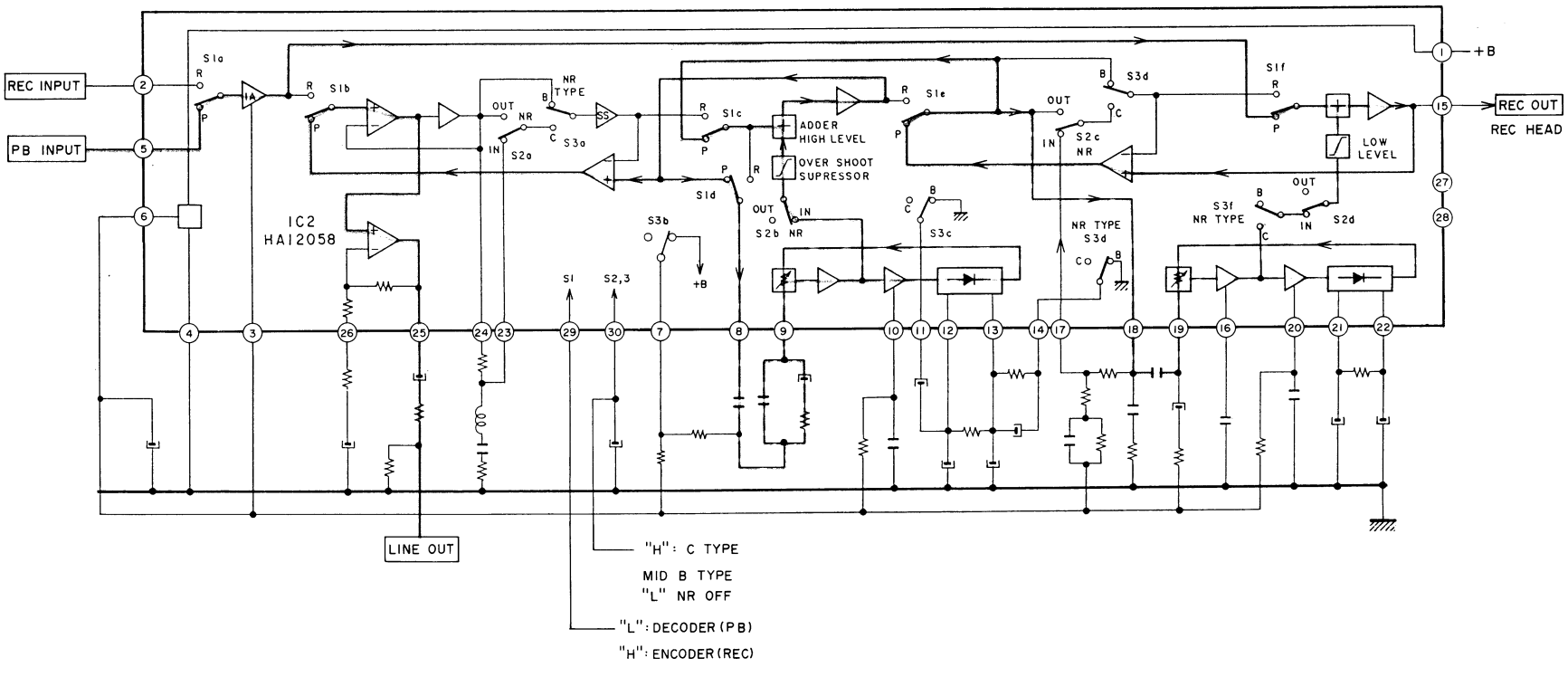
DOLBY B "ON" P.B MODE



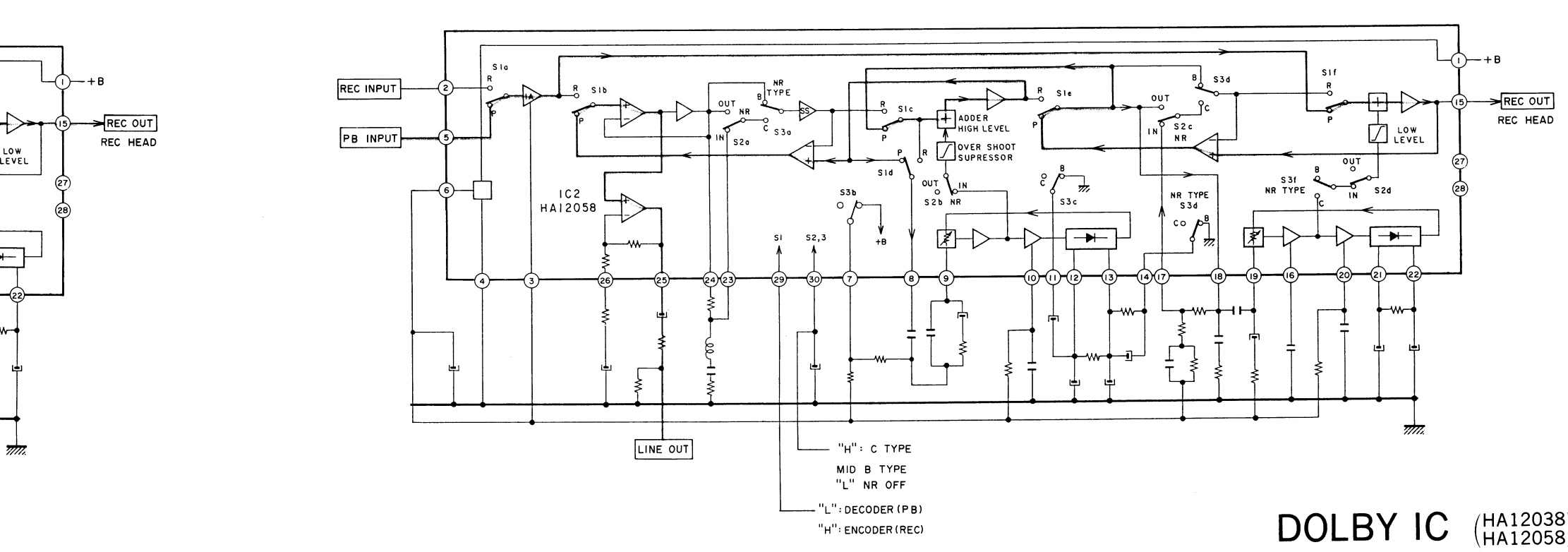


DOLBY C "ON" P.B MODE





DOLBY "OFF" P.B MODE



DOLBY IC (HA12038 / HA12058)

SIGNAL LINE